SWIMMING SIMPLIFIED

REVISED AND ENLARGED

LYBA *and* NITA SHEFFIELD

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Revised and Enlarged Edition

BY

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FOREWORD

In the "Life and Letters" of Francis Lieber one catches intimate glimpses of the life and thought of a great teacher, a foremost student of political economy. It is worth while to recall Lieber's interest in physical education, and especially in swimming. Following the work of Dr. Charles Follen in Boston, Francis Lieber set about preparing a swimming school after the model of those established by General Pfuel in many German cities. The following excerpts from one of his letters give significant points of view:

Boston, September 6, 1827.

You know already that six weeks ago I established a swimming school on the plan of General Pfuel. Yesterday the Mayor called on me and said Mr. Adams, the President of the United States, wished to visit my school. . . . Mr. Adams, who is a man of few words, asked me simply, after shaking hands with me, if he might see the school, and what hour would suit me. . . .

We prepared ourselves for the bath, and this man of sixty-one sprang headlong into the water from a spring-board six feet high. He repeated this several times, and swam about a quarter of an hour, conversing with me while he was in the water, and showing himself an experienced swimmer.

He praised the school and expressed the wish that there were many establishments of the kind in the country, which would greatly tend to promote the public health. He said, also, he had tried all kinds of gymnastic exercises, but never had found greater refreshment after continuous mental exertion than from swimming.

In Lieber's diary the following laconic report is found:

August 6, 1830. Saved two little boys from drowning.

Thus in 1827 and 1830 swimming had significance. It has such to-day. On the physiological side it is an unrivaled form of exercise for most persons; it favors health and contributes greatly to safety.

But it seems to be most significant in relation to leisure-time uses, and its adaptability for all ages and both sexes. The

judgment is becoming more established that health, strength, and vitality cannot be acquired in youth and stored as a sort of reserve against use in adult life. On the contrary, the view prevails, more and more, that these desirable qualities of life come from a mode of living, that they flow from life, and that therefore no specialized early training can make them safe or permanent. Thus, swimming as an avocation becomes at once the way of life for many persons, and only the limitation of facilities prevents a more general expansion of the activity.

If the present increase in leisure time for all people keeps up without a corresponding increase in leisure-time education, another generation will find intensified the problem of "What shall we do?" While there are many wholesome activities which may contribute to proper employment of leisure-time opportunities, it is probably true that motor activities will more nearly satisfy the majority of people. Swimming ranks high in its usefulness as an activity for leisure time.

Now, it is the most elementary truth in the field of physical education that people enjoy doing and participate in those activities that they do well. The novice in any activity prefers to sit on the side-line, and will sit on the side-line regardless of our arguments and persuasions. The notion that one should learn to swim only well enough to keep one's head above water is comparable to saying that one should learn to walk well enough not to stagger. But walking is more than a means of getting about. Some people can only see cows in terms of leather boots. Skill and proficiency in swimming are intimately related to enjoyment of the activity, and hence to its continued use.

Moreover, the more young persons we can teach to swim, the more individuals will we add to society who have learned something for other than economic reasons. Education for enjoyment and education for fine living are not in need of defense. One has only to observe the mistaken zeal of those who think of life in terms of financial rewards, trusting somehow that later on, when success comes, happiness may be bought.

So while some may praise this text as it contributes to healthful practices, or to safety education, or wholesome use of leisure time—and these are all commendable—I am inclined to give swimming most praise as an activity for all, to be enjoyed by all for its own sake.

JESSE FEIRING WILLIAMS.

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INTRODUCTION

In reviewing the history of this important branch of recreative science, one finds it was only a few years ago when instruction in swimming was considered unnecessary. One need but refer to the hazardous experience of many in learning by the old sink-or-swim method and the various crude systems of instruction which were later evolved.

The previous editions of "Swimming Simplified," during a period of many years, have been used successfully in the instruction of thousands of students. Marked changes have occurred in the theory and methods of teaching swimming. To keep pace with the rapid progress of the natation world the authors have compiled the latest ideas and teaching methods in this new edition of "Swimming Simplified."

A scientific page has been turned in this great era of progress, especially in the art of natation. A universal demand has been made for methods of teaching swimming which are in accordance with the highest standards of education. Briefly stated, the work should be conducted so as "to provide an opportunity for the individual to act in situations that are physically wholesome, mentally stimulating and satisfying and socially sound."

This book is offered as a text to meet the educational, physical-educational and swimming demands of the universities, schools, clubs, camps and recreational centers as well as the needs of the individual. It can be used by men, women and children. The lessons have been arranged in their logical progression and graduated to serve beginners, intermediates and advanced students. A special chapter on "How to Teach" has been carefully arranged for the prospective instructor or coach. A comprehensive and realistic chapter on life saving, with graded swimming and life-saving tests, has been added in order that the individual might become a competent swimmer, capable of saving his own life and, when properly trained, the lives of others, thus helping to reduce the frightful death-rate due to drowning.

A swimming and life-saving test should be one of the graduation requirements in every institution of learning, from the elementary through the advanced. Instruction should not be limited to university students, however, for it is imperative that all youth receive training in swimming and life saving.

It is not necessary to dwell at length on the values of swimming since it has the indorsement of the leading medical authorities, directors of physical education, aquatic experts, national health and recreational organizations.

Let us consider the subject from the viewpoints which are most appreciated, that of pleasure and sociability. It is one of the best activities for bringing spontaneous joy to the individual, for it can be indulged in by all ages, men, women and children alike. Swimming and its allied branch of water sports furnish wholesome and natural forms of exercise. Those who can swim have but to review the keen pleasure derived from this sport.

By properly supervising swimming the highest ideals may be inculcated, such as courage, self-confidence, leadership, a democratic spirit, good sportsmanship, self-sacrifice and heroic service. These ideals form a vital part of one's training for citizenship.

From a physiological standpoint, swimming is one of the most healthful exercises for symmetrically developing the body, for by strengthening the entire system it tends gradually to establish normal proportions, and well coördinated movements in swimming contribute toward relaxation and power, while in diving grace and poise are fostered. Through this activity the lung capacity is increased, the circulation stimulated and digestion improved.

Swimming may be used as a means of developing good posture; it has been successfully employed in orthopedic work for cases of postural defects, flat feet, paralysis, etc.

In order to obtain the full benefit of the text the reader should know how to study or visualize the body in movement (that is, to think in a motor way), so as to apply each lesson most effectively. Learning to swim or acquiring any motor skill necessitates using the mind the same as in academic subjects. The following suggestions will assist the reader in acquiring this ability:

First, carefully study your assignment, which may involve one or more problems (or objectives). Review your assignment several times, try to picture it and practice it according to the

directions. *Second,* reënforce your study by going into the theory, or "the why," behind each movement. *Third,* apply the theory in the water or attempt to solve your problems by converting your ideas into action. Perform each exercise slowly, so you can intelligently direct each movement. And *fourth,* verify your results by checking each part of the movement as you perform it. By this procedure you are able to study your difficulties and help to eliminate them. Successful results also hinge upon your whole-hearted response and "practice with satisfaction."

It is the writers' hope that this text-book will serve the needs of the individual, class and instructor.

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We are grateful to the thousands of our students who have been an inspiration for further study and for the writing of this book.

LYBA AND NITA SHEFFIELD.

SWIMMING SIMPLIFIED

CHAPTER I

BEGINNER'S FIRST LESSONS

The first requirement in learning to swim is to feel at home in the water. This is accomplished by knowing how to solve the various problems relating to breath control, floating and regaining standing position. The beginner's fears are based upon ignorance of these fundamental principles.

1. PRELIMINARY STEPS FOR INSPIRING THE NOVICE WITH CONFIDENCE

The beginner feels at ease in the water and becomes so interested in these elementary water games that fear is dispelled, for these preparatory steps are a source of enjoyment, inspire confidence and lay the foundation for the fundamentals of swimming and diving.

Introduction to King Neptune's Realm

A region unknown invites us to play and feel at home, so with never a thought of fear or despair we eagerly await the explorations there.

Sit about the edge of the swimming-pool, rest the feet on the railing (or, if a rail is not available, place the feet in the water). Now, join hands and, at a given signal, jump into the shallow water feet first.

Jumping the Breakers

Grasp the railing or join hands in a line or circle formation. Enter into the spirit of jumping the breakers with carefree abandon, rising high out of the water, then submerging the

shoulders or dipping under (see Fig. 4, page 3). In this vigorous play fears are unconsciously swept away.

Walking Race

The teams should line up on opposite sides of the pool, join hands and, upon a given signal, race to the center, then about face, return with hands joined. The team wins which succeeds in getting all of its members back to the starting-place first.

Walking Race, Using Crawl Arm Movements

The teams assume the same line-up as described in the preceding race. When directed to start they walk across the pool, using a crawl arm movement.

Chain Race

Stand in column formation, place the hands around the waist of the person in front of you and, at a given signal, race to the opposite side, attempting to get there by jumping, walking, running, etc., without breaking the chain.

2. BREATH CONTROL

Often emergencies arise which require a knowledge of breath control as an assurance against strangling. Choking is caused by getting water into the air-passages either accidentally or by not knowing how to prevent it.

Air and water cannot occupy the same space at the same time. To avoid choking one must have a greater pressure of air in the nose, so as to counteract the upward pressure of the water.

Home Practice

The dread of many beginners is to place the face in the water. To gain confidence practice the following exercises:

Starting Positions: The starting positions for *Exercises 1, 2* and *3* are as follows: Place the side of the face in the water, raise the mouth sufficiently to clear the surface. (Use a large basin filled with water, see Fig. 1, page 3.)

Exercise 1. Holding the Nose.

Take a deep breath, close the mouth and submerge the face. Hold your nose if desired. While holding the breath for a

Breath Control: Fig. 1. Breath control, home practice. Fig. 2. Breath control, pool practice. Fig. 3. Partners' Introduction. Fig. 4. Jumping the Breakers.

few seconds *open the eyes.* Then return to starting position. Repeat this exercise several times.

Exercise 2. Exhaling Under Water.

Take a deep inhalation, close the mouth, submerge the face and exhale some of the air through the nose under water. Return to starting position and exhale the rest of the air above the surface. Repeat several times.

When first practicing this exercise the beginner should feel a rather forceful and continuous exhalation all the while the face is submerged and until starting position is resumed. When executed correctly the novitiate is aware of a continuous blowing of bubbles.

Exercise 3. Holding the Breath.

First, practice this exercise on land. Take a deep breath, then hold the nostrils, exhale gently, experiencing a slight pressure, or plugged feeling. Second, place your hand under the nostrils. Take a deep breath, then exhale, feeling the pressure of air on the hand. In the midst of the exhalation stop, but have the same feeling of forcing the air out of the nose. One should be constantly aware of this forced pressure of air, or the sensation of tension in the nose and throat.

Water Practice

Starting Position: Enter the shallow area of the pool. Submerge the shoulders. Place the side of the face in the water, mouth raised sufficiently to clear the surface (see Fig. 1, page 7).

Exercise 4. Application of Breath Control.

Practice the preceding exercises, with the *eyes open,* until all fear and discomfort of submerging the face are overcome (see Fig. 2, page 3).

Gradually increase holding the breath up to thirty seconds. (The length of time one is able to hold the breath depends upon the individual's breath control, lung capacity and the amount of practice.)

Faults and Their Correction

If the face is submerged with the mouth opened, the beginner is likely to swallow water.

Accidentally inhaling while the face is under water causes choking, or

failing to feel a plugged sensation usually results in the water entering the air-passages. Correct by feeling a forceful pressure of air in the nostrils.

Ducking the Breakers

This is an interesting game for applying the preceding exercises.

Join hands in couples, lines or circle formation. Jump several times in place, then as the imaginary wave is about to break duck under. After the supposed wave has passed, rise to the surface with the hands joined (see Fig. 4, page 3).

Diving for Objects

A variety of these games may be enjoyed, such as counting each other's fingers under water, diving toward your partner's feet, picking up coins, chips, pebbles or other objects.

Under-Water Tag

One or more players may be appointed "it." To avoid being tagged, player must duck his head under water.

Partners' Introduction

This game may be used as a social mixer.

Join hands, partner formation. Exchange names. At a given signal duck under quickly, come up and call your partner's name.

The game also may be played by having the class in a double-circle formation. The inner circle moves to the left, while the outer goes to the right. When a signal is given, join partner's hands, exchange names, duck under, come up, call each other's name and continue on. Progression in the circles may be made by walking, running, jumping, skipping or swimming (see Fig. 3, page 3).

3. LEARNING TO BREATHE CORRECTLY

It is impossible to swim any stroke successfully without knowing how to breathe correctly. This consists of repeated inhalations through the mouth and forcible exhalations through the nose. Breathing in this manner prevents choking and is a safeguard against sinus trouble from swimming.

Normal breathing is inhibited through fear. The breathing must be regular and easy. A frightened person usually holds

the breath as long as possible. To correct this be aware of forcibly exhaling through the nose at regular intervals.

Practice this exercise until breathing in this new manner becomes natural and rhythmical.

Home Practice

Starting Position: Place the right side of the face in the water and *look* to the side. Lower the top of the head and tilt the chin upward, thus raising the mouth sufficiently to clear the water surface.

This position is suggested because most individuals swim on their right side. The reverse is true for those who swim on their left side.

Inhale—exhale: Breathe in through the mouth, then close it. Submerge the face sufficiently to cover the nose and mouth, eyes at the water surface, and *look* straight ahead. Then forcibly exhale most of the air through the nose, thereby blowing bubbles. Turn the head, as in starting position, *exhale the remaining air forcibly through the nose,* thus avoiding the unpleasant sensation of inhaling water.

Repeat this exercise. Then, without stopping or touching the face, continue rhythmically from five to fifty times.

Water Practice

Practice the preceding exercise in the shallow area of the pool, with the shoulders submerged, arms resting on the water surface or hands holding the railing or the steps (see Figs. 1 and 2, page 7).

Faults and Their Correction

By inhaling through the nose one does not obtain as much air as through the mouth and is liable to sniff water up the nose and choke. Correct by taking a quick, deep gasp of air through the mouth.

By exhaling in a jerky, spasmodic fashion one is likely to take in water. Correct by feeling a steady, forceful pressure of air during the entire exhalation, which would result in a continuous blowing of bubbles.

Failing to forcibly exhale the remaining air above the water surface before each inhalation may cause choking, because one is liable to have a wash of water over the face at this interval.

Breathing and Floating Face Submerged: Fig. 1. Breathing, inhalation. Fig. 2. Breathing, exhalation. Fig. 3. Face-submerged floating, while holding railing. Fig. 4. Face-submerged floating.

Failing to completely exhale the impure air each time before taking another breath causes fatigue and results in a choked feeling.

4. FACE-SUBMERGED FLOATING AND REGAINING STANDING POSITION

Theory of Floating

Buoyancy is the ability to float. There are two opposing forces acting upon a floating body at rest, namely, the buoyant effect of the water acting upward and the pull of gravity acting downward. The upward pressure is equal to the weight of the fluid which the body displaces. If the weight of the body is equal to the upward pressure of the water it will float; if greater it will sink. It will be seen, then, that floating depends upon the density of the liquid and the density of the body placed in it (depth of water has nothing to do with it). Nearly every one will float in sea water because it is heavier bulk for bulk.

To test your buoyancy power, take a deep breath and assume a face-submerged floating position (or duck the head and grasp the ankles). If the entire body goes under, and remains under, you cannot float.

Persons who possess buoyancy should attempt face-submerged floating. It is one of the easiest possible floating positions, since the novice is simply applying the breath-control exercises and rests on the water in a relaxed and natural position (see Fig. 4, page 7).

Regaining Standing Position From Face-Submerged Floating

The beginner usually finds it difficult to regain standing position once the feet are off the bottom of the pool; therefore it is essential that he should know how to get up correctly, thus avoiding the possibility of a struggle and choking.

The object of this exercise is to change the body position from horizontal to vertical. This is accomplished by first bending the knees, which breaks the horizontal line and helps one to assume a semi-sitting position. Therefore, the most important point to remember is *"knees up!"* Then when the arms are brought down to the sides of the body from the front-horizontal position this pressure against the water lifts the upper part of the body, thereby enabling one to more nearly approximate the upright position. Straighten the legs and place the feet far apart

Regaining Standing Position From Face-Submerged Floating: Fig. 1. Starting position. Fig. 2. Knees up! Fig. 3. Arms down! Fig. 4. Feet replaced, standing

on the bottom of the pool. This gives one a feeling of steadiness and greater security. Once the feet are placed firmly on the bottom, slowly raise the head, thus avoiding the tendency of throwing the body back or losing balance.

Progressive Steps for Regaining Standing Position From Face-Submerged Floating Are:

(1) Carefully study your assignment.
(2) Analysis for regaining standing position, land practice.
    (a) Standing about the pool or in the water.
(3) Application of this exercise, in the water.
    (a) Float face submerged, then get up.
    (b) If difficulty is experienced, review each step slowly, practice with a partner or place the fingers lightly in contact with the railing or steps.

Land Practice

Starting Position: Stand, raise the arms to a vertical position and lock the thumbs. Bend forward to the imaginary waterline and place one foot to the rear. Then lower the head between the extended arms (see Fig. 1, page 9).

Count 1. Knees up.

Bend the knee, finishing with it close to the chest (but pretend that both knees are raised, as it is accomplished in the water), and feel a decided bend at the waistline (see Fig. 2, page 9).

Count 2. Arms down.

Forcibly bring the extended arms down to the sides of the body, having the feeling of raising the upper part of the body (see Fig. 3, page 9).

Count 3. Feet replace.

Place the feet apart on the floor (see Fig. 4, page 9).

Count 4. Head up.

Slowly raise the head and assume standing position.

Water Practice

Starting Position: Lightly rest your hands upon your partner's, who places his about ten inches below the water surface.

Floating Face Submerged and Regaining Standing Position: Fig. 1. Face-submerged floating. Fig. 2. Knees up! Fig. 3. Arms down, feet replaced, standing.

Then assume the face-submerged floating position by submerging the shoulders and relaxing the arms, extending the legs to the rear until just the toes are in contact with the bottom of the pool. Then slightly raise one leg, relax the body and feel the buoyancy of the water.

Or start face-submerged floating by *lightly* touching the railing with the finger-tips. If a railing is not available, place your hands upon the steps or bottom of the pool (see Fig. 2, page 7).

Float: Take a deep inhalation through the mouth and quickly duck the head until the chin touches the chest. Then push off gently with the supporting foot, finishing with the legs extended near the water surface, body relaxed and in correct floating position (see Fig. 1, page 11). During the float, be aware of ducking the head well under, raising the hands toward the surface and relaxing the body. While in this position one tends to float more horizontally and is better able to get the maximum lifting power, or buoyancy, from the water.

Stand: Regain standing position by bending the knees until they nearly touch the chest (see Fig. 2, page 11). Attempt this first step while floating face submerged or while the *fingers are lightly* in contact with your partner's hands or the railing. Then bring the arms down to the side of the body with a steady pressure while the knees remain flexed. Place the feet on the bottom of the pool and slowly raise the head (see Fig. 3, page 11). While regaining standing position think: "Knees up, arms down, feet replace, head up!"

Faults and Their Correction

Failing to take a deep breath before submerging the head decreases body buoyancy.

Attempting the face float with the head raised sinks the feet. Correct by first submerging the shoulders, then assuming the proper take-off.

Starting with a marked rigidity and elbow bend or overstraightening the arms interferes with floating. Correct by relaxing the arms.

Starting with one or both feet under the body supports it, preventing the action of buoyancy. Correct by extending the legs backward until just the toes are touching the bottom of the pool and the shoulders are submerged.

Starting by jumping up and then falling on the water usually frightens the novice and delays him in obtaining the correct floating position. Correct by first submerging the shoulders, then assuming the proper take-off.

Attempting to regain standing position by just raising the head makes it impossible to get up, since there is not sufficient change of weight. Correct by first bending the knees and keeping the head under the water until the feet are securely placed on the bottom of the pool.

Getting up by forcibly jerking the head back before the feet are placed on the bottom of the pool usually results in a struggle to regain position. Correct by slowly bringing the head and body to the erect posture after the feet are firmly placed on the bottom of the pool.

Face-Submerged Floating Competition

Upon a given signal two or more teams float face submerged (or by grasping the ankles) for a designated time. At the end of that period the team wins which has the greatest number floating.

Diving Through the Arches

This game is played by having the couples stand in a double-circle or line formation, partners facing each other. Number one couples form archways by joining hands in a line or circle formation or just by spreading the feet far apart. Couple number twos will then duck their heads between the extended arms and lock their thumbs, assuming a diving position. Upon a signal number twos will push off from the bottom of the pool and dive under the archways. Number ones will assist, if necessary, by pushing them under. Repeat this game letting number ones assume the diving position (see Fig. 1, page 239). This game may be varied by diving for each other's toes or for objects.

5. FLOATING AND REGAINING STANDING POSITION

Value of Floating

A person may save his life through the ability to float or swim!

Frequently a swimmer overestimates his strength and swims a greater distance than he realizes, becomes frightened and is unable to return. At this point a knowledge of floating would enable him to rest and then swim back to safety.

If a novice unexpectedly finds himself in deep water and finding no bottom when he attempts to stand, he could calmly meet this emergency by floating or treading.

In case a boat or canoe capsizes, one may be called upon to wait a long while until help arrives. When no other means of support is available floating or swimming is imperative.

If a swimmer is seized with a cramp he should float while attempting to remedy it or while waiting for assistance.

For the individual who cannot float, treading water, sculling or swimming should be substituted.

When frightened or fatigued, float, tread water or swim on the back!

Regaining Standing Position From Back Floating

Before learning to float the beginner should know how to regain standing position.

One cannot change from the floating position on the back to a standing position while keeping the body extended, because a sufficient weight forward is required to lower the feet. Therefore the greatest factor contributing to this is a *marked forward bend,* which helps to relax and sink the hips. Then the head is brought forward over the feet by relaxing and rounding the back, and the final impetus in obtaining the correct position is accomplished by scooping the arms forward. Then place the feet apart on the bottom of the pool, which affords a steady base. Be sure that the feet are securely placed on the bottom of the pool before raising the head, so as not to throw the body backward.

Progressive Steps for Regaining Standing Position From Back Floating Are:

(1) Carefully study your assignment.
(2) Analysis for regaining standing position, land practice.
    (a) Standing about the pool or in the water.
(3) Application of this exercise, in the water.
    (a) Float on the back, then get up.
    (b) If difficulty is experienced, carefully review each step and have a partner assist.

Land Practice

Starting Position: Stand, incline the body slightly backward and raise the arms side horizontal with the palms down. Then

Regaining Standing Position From Back Floating: Fig. 1. Starting position. Fig. 2. Knees up, head forward. Fig. 3. Arms scooping. Fig. 4. Feet replaced, standing.

place one foot forward, toes touching the floor (see Fig. 1, page 15).

Count 1. Knees up.

Raise one knee toward the chest (but consider that both knees are flexed as in the water application), at the same time feel a *marked bend* at the waistline (see Fig. 2, page 15).

Count 2. Head forward.

Duck the head by bending forward, attempting to touch the knee with the chin (see Fig. 2, page 15).

Count 3. Arms scoop.

At the same time use a scooping movement by bringing the arms back, down and forward (see Fig. 3, page 15).

Count 4. Feet replace.

Place the feet on the floor having a wide base for support (see Fig. 4, page 15).

Count 5. Head up.

Slowly raise the head and stand.

Water Practice

Starting Position: Form in double lines or in couples about the pool. Number ones practice floating while number twos assist, if necessary. Number twos stand to the rear of number ones with arms extended while lightly holding the shoulder-straps. Number ones assume starting position by submerging the shoulders and placing the arms in the side-horizontal position with the palms on the water. Incline the body backward until the head is placed in the water, and the ears are covered. Feel as though you were resting your head on a pillow.

Float: Inhale and gently push off from the bottom. Have the feeling of stretching the body from the head to the toes, while slightly hollowing the back. When taking off in this manner one quickly assumes the correct floating position without the possibility of ducking under and choking or sinking the hips (see Fig. 1, page 19). Number twos may assist number ones in floating by seeing that the head is back with the chin in and that the hips are raised by slightly pressing up against the back.

A correct floating position necessitates holding the head well back with the ears under, chin down and looking toward the feet. Extend the body but feel the utmost relaxation. For many

there is a tendency for the feet to sink. Raise center of gravity by flexing the legs, raising the arms over the head and breathing naturally.

Stand: Number ones attempt to regain position, number twos assisting, if necessary, by pushing the head forward. Take the exercise slowly, feeling the effect of each change in balance. First, bend the knees, at the same time have the feeling of relaxing and sinking the hips, as in a sitting posture (see Fig. 2, page 19). Second, relax and round the back, attempting to get the head over the feet (or touch the knee with the chin) while forcibly scooping the arms forward. This submerges the head and enables one to obtain correct balance for regaining standing position. Third, replace the feet on the bottom of the pool, with a wide base, and stand.

Get up, thinking through each movement as you slowly apply the following directions: "Knees up, head forward, arms scoop, feet replace, head up!" Or remember: "Bend in the middle and scoop!"

Faults and Their Correction

Holding the breath with a limited supply of air or taking short gasps decreases body buoyancy and causes tension. Correct by breathing naturally and taking deep inhalations.

Holding the head forward when floating sinks the feet and tends to submerge the body. Correct by placing the head back until the ears are under, and look up.

Starting by arching back too far submerges the head. Correct by slightly leaning forward and looking at the feet.

Floating with the arms held above the water sinks the body. Correct by feeling the arms in contact with the water.

Floating with the entire body held rigid and the eyes closed results in fatigue and increases fear. Correct by feeling relaxed, opening the eyes and having some one near until the initial fear is dispelled.

Starting with the head and shoulders above the water and then jumping up temporarily submerges the body. Correct by submerging the shoulders and having the head rest on the water and gently push off.

Attempting the floating position by just kicking the feet up results in a marked hip flexion and a temporary sinking of the body. Correct by first leaning back, raising the hips and gently pushing off.

Attempting to stand by just moving the head forward without first bending the knees and sinking the hips makes it impossible for one to get up, as there is not sufficient weight over the feet to sink them.

Endeavoring to get up by simply flexing the knees without bending

forward handicaps one in trying to stand, since there is not an adequate change of weight.

If one suddenly throws the body back while trying to get up the body will temporarily sink. Correct by relaxing the back and trying to touch the knees with the chin.

Undertaking the arm scoop with the body in a horizontal position will not aid in ducking the head. Correct by making sure that the arms remain side horizontal, acting as a support and balancing agency, until the hips have sunk and the head is nearly forward.

Float Tag

Several members of the class are appointed "it." To avoid being caught assume a face, back, sitting or vertical floating position. The last three tagged are "it" for the next game.

Swing and Glide (or Dive)

Form a large circle in groups of threes, couples face each other and hold the hands of the one floating. Swing him three times, and on the last count the performer glides feet first over the water from the impetus of the swing.

Another variation of this game is to have couples join hands, forming a seat for the third member. Swing him three times and, on the last count, lift him into the air for his dive. Plunge toward the center of the circle then change places.

6. CHANGING BODY POSITIONS

Necessity may demand a turning of the body from one position to another, as in changing from one swimming stroke to another.

Land Practice

As a preparatory step the following exercises may be practiced at home or about the pool:

Water Practice

Changing Floating Position From the Face to the Back

First Step:

Starting Position: Standing in shallow water (or about the pool), incline the body slightly forward, submerge the shoulders,

Floating on Back and Regaining Standing Position: Fig. 1. Back floating. Fig. 2. Knees up, head forward. Fig. 3. Arms in vertical position to help prevent sinking of feet. Fig. 4. Class attaining standing position from back floating, arms scooping, feet replaced, standing. Fig. 5. Class practicing back floating.

extend the arms front horizontal, palms resting on the water surface (see Fig. 1, page 21).

Left-arm pull and body turn left: Forcibly pull the extended left arm straight down through the water to the side of the body and quickly continue this arm swing just over the water surface (see Fig. 2, page 21), finishing with both arms in side-horizontal position. Simultaneously the right shoulder lowers while the right arm is extended to the side. A quick head and body turn to the left accomplishes this exercise.

SECOND STEP:

Starting Position: Assume the face-submerged floating position.

Left-arm pull and body turn left: Practice the turn as described under the first step while thinking: "Pull left, turn left!" The arm pull and continuous swing over the water, accompanied with the forceful turn of the head and body, enables one to change position.

Changing Floating Position From the Back to the Face

FIRST STEP:

Starting Position: Stand in shallow water or about the pool, and submerge the shoulders, arms side horizontal, resting on the water surface (see Fig. 3, page 21).

Right-arm swing and body turn left: Forcibly and quickly swing the right arm over the water, at the same time move the left arm back and lower the left shoulder (see Fig. 4, page 21). Quickly turn the head and body to the left, finishing with both arms in front-horizontal position.

SECOND STEP:

Starting Position: Float on the back a few seconds.

Right-arm swing and body turn left: Then practice the turn as described in the preceding step.

Changing From Face-Submerged Floating to the Right Side

Forcibly and quickly bring the extended left arm down to the side of the body. At the same time quickly turn the head and body to the left. The extended right arm remains in starting position. Finish with the body resting on the right side.

Changing Body Positions: Fig. 1. Starting position, face-submerged float. Fig. 2. Turning from face to back, pulling left arm, turning body left. Fig. 3. Starting position, back float. Fig. 4. Turning from back to face, swinging right arm forward, turning body left.

Regain standing position by bending to the left and bringing the right hand down to the side of the body.

Changing From Back Floating to the Right Side

Bring the left arm down to the side of the body and at the same time turn on the right side, finishing with the right arm extended in line with the body and look toward the feet.

Faults and Their Correction

A deep inhalation is necessary since the breath must be held during the turn.

Correct starting positions must be held before and after the turn. It facilitates the turn and quickly adjusts the body to the new position.

Starting a turn with the body doubled up or held too rigid interferes with the turn.

Making the turn by just using the arms usually does not give sufficient momentum to complete the turn. Correct by forcibly lowering the shoulder and swinging the head and body in the direction of the turn.

Review Questions

1. Why is it necessary to learn how to control the breath?
2. Upon what principle is breath control based?
3. How can one be assured of adequately controlling the breath?
4. Why does swimming require a different method of breathing?
5. What are the essential points to be stressed when breathing in this new manner?
6. What principles govern the changing of the body position from the horizontal to the upright position?
7. What procedure would you follow for changing the body position from the horizontal to the upright during the face and back float? Why?
8. What is floating? Explain.
9. Can every individual float? Why?
10. How could you assist an individual whose body sinks during the motionless float?
11. How can center of gravity be raised?
12. How is the body turn from one position to another accomplished?

Having learned all the exercises in this chapter, the novice is ready to proceed with his first stroke.

CHAPTER II

DEEP-WATER EMERGENCY TESTS

The value of the deep-water emergency tests cannot be overemphasized when one realizes how many lives might have been saved had an adequate preparation been given the prospective swimmer. Few instructors or coaches realize the necessity for safeguarding the novice by preparing him for the various exigencies which might arise. Most teachers feel that their obligations have been met when they have taught an individual to swim across a swimming-pool. Even though the novice had received the added instruction in floating and diving, it would not be a safeguard against danger unless properly applied.

Let us review some of the casualties due directly to ignorance of these important principles:

Children and adults have lost their lives in shallow water. This is usually caused by the beginner attempting to swim a few strokes and accidentally getting water into the air-passages, resulting in a strangling feeling. He then frantically tries to get up and, in the struggle, gets more water, continues choking, and is soon exhausted. If the novice had known how to control his breath and regain a standing position this disaster would have been averted.

Others have endangered their lives by unexpectedly finding themselves in deep water. They attempt to stand and, finding they cannot touch the bottom, become excited, thinking they are going to drown. Usually they raise the hands above the head, call for help and, in their frantic struggle, sink the body. Such drownings could have been avoided had the swimmers known they could keep afloat in a correct vertical position or by treading water.

When swimming, the novice might become frightened, raise the arms, sink the body and, not knowing how to come up, drown. The knowledge of how to reach the surface would have been his safeguard.

Another instance resulting in difficulty is that of a beginner trying to change body positions while in deep water or turning about. In the process of turning the body tends to assume a vertical position and sinks. If the beginner had remembered previous instructions of how to change body positions or turn around this hazard would not have occurred.

The popular notion "that an individual can be taught to swim in thirty or forty minutes" is misleading. Many a novice obtains the idea that because he can swim a few strokes that he is able to take care of himself in the water. The adage, "A little knowledge is dangerous," certainly applies here. For, without understanding how to meet the various emergencies which might arise, he is in great danger.

The coach's moral obligation to his pupil is to adequately prepare him to meet these emergencies. It is the pupil's responsibility to acquire enough skill so he can save his own life. The goal should be: *Every individual a swimmer and every swimmer his own life-saver, then, if properly trained, the life-guard of others!*

1. PRELIMINARY TESTS

As a safeguard, review the following preparatory tests in shallow water before applying them in the deep water.

(1) Back Floating

Float correctly for a minute and regain standing position (see Fig. 5, page 31). (Refer to page 13, Floating and Regaining Standing Position.)

(2) Changing Body Positions

Demonstrate your ability to turn from one position to another while floating or swimming. (Refer to page 18, Changing Body Positions.)

(3) Sitting Float

Float in a sitting position, with the head back, chin up, arms side horizontal, knees flexed, thus testing buoyancy in this position (see Fig. 1, page 27).

(4) Treading Water

Acquire sufficient skill so you can tread with ease in deep water.

Start from the sitting or vertical float position, move the head forward to the erect position, then attempt to tread water. This is necessary, because one could not keep afloat with the head held out of the water unless supported by a continuous downward pressure of the hands or the proper leg action.

The arm movements for treading water are a modification of sculling. Start with the palms down, arms approximating side-horizontal position. Bring the hands up and in toward the chest (see Fig. 3, page 27), then move them down and out to the side (see Fig. 4, page 27). Exert a steady downward pressure throughout the movement. Other variations might be used.

The vertical scissors kick gives the body added support. Slowly spread the legs, left forward, right to the rear (or the reverse), knees slightly bent. Open the legs easily and snap them together. This forces the water down and away from the body, thus lifting it. A movement similar to riding a bicycle or walking upstairs could be substituted. Pressing down against the water raises the body. Practice treading with the legs alone, arms alone, then combine both.

After you have learned to tread water, combine it with swimming. Start from a back float or push-off. Swim a few back strokes. Then assume a sitting or vertical position, tread water, resume the back float and continue swimming. Repeat this combination several times using other strokes.

The change from the float to the sitting position is accomplished by bending the knees and sinking the hips. This is followed with a forward bend of the body combined with a forward scooping arm movement. Then change to the back float by straightening the body and legs and placing the head back with the chin in.

(5) Elementary Swimming Tests

(a) Swim the coördinated elementary back stroke, using a straight leg kick (demonstrate your ability to keep your course), ten to twenty yards. (Refer to page 49, Elementary Back Stroke.)

(b) Swim the coördinated sculling stroke, or swim with the arms alone, ten to twenty yards. (Refer to page 60, Sculling Stroke.)

(c) Swim the side stroke or preliminary crawl, in fair form,

ten to twenty yards. (Refer to page 65, Side Stroke; page 86, Preliminary Crawl.)

2. TESTING BODY BUOYANCY IN VERTICAL POSITION

A person may feel at ease while floating on the back, but often fails to realize he will continue to float even when the legs are lowered as in a standing position. Ability to float on the back is a guarantee that one can float in a vertical position, the body displacement being the same in each case.

(1) Vertical Floating While Holding Rail

While in deep water, lightly grasp the railing or some support close to the water. Straighten the body, relax the arms, take a deep breath and lower the head back in the water until the ears are submerged. Then feel the body relaxed and floating vertically. Repeat several times until convinced that the water has enough upward pressure to support you in this attitude.

(2) Vertical Floating

This test gives the novice who is buoyant a fuller realization of the upward pressure of water and it gradually increases confidence.

Lightly grasp the railing with one hand, rest the free arm on the water surface, finishing with both arms in side-horizontal position. Assume the vertical float with the head back, chin up, body relaxed. Practice this until convinced of the body's vertical buoyancy.

With some one standing by to offer assistance if needed, let go the railing and float alone (see Fig. 2, page 27); also assume the vertical float with the arms held at the sides of the body.

(3) The Float, the Forced Sinking, the Lift

The novice has proved in the preceding test that the body will float vertically. Therefore, to sink it will be necessary to move the head forward or raise one or both arms over the head (see Fig. 2, page 31). After this forced sinking the body is quickly buoyed to the surface (see Fig. 3, page 31).

In other words, granted that the beginner has sufficient air in the lungs, is in good position, he will float vertically. Here he must use one of the mentioned means to sink himself and,

Testing Body Buoyancy and Treading Water: Fig. 1. Sitting float. Fig. 2. Vertical float. Fig. 3. Treading water, hands up and in, vertical scissors. Fig. 4. Treading water, hands forced down and out, close kick.

once under, he will not remain there but is quickly lifted up. What greater assurance of the friendliness and support of water need one have?

While grasping the railing take a deep breath, push the body under arm's length (but do not let go the railing) and open the eyes. Then relax the arms so as to feel the lifting power of the water. Soon the body will float to the surface. Practice this several times if necessary.

Then push the body under, and let go the railing. The body will rise to the surface. Then grasp the rail. Repeat this until you have proved the significance of body buoyancy and its recovery in the vertical position.

This experiment should convince the most timid person of the great buoyancy of water; that is, as long as the lungs are filled with air. Some persons are so heavy in the water they are unable to assume the motionless float. In cases like this treading water will be necessary.

3. TESTING EFFECT OF CHANGING ARM POSITIONS WHILE FLOATING VERTICALLY

This test demonstrates the effect of sinking and saving one's self by means of an upward and downward pressure or force against the water.

(1) Arm Movements Which Control Raising and Sinking the Body

Grasp the railing with one hand and finish with the arms in side-horizontal position. Then bring the free arm down to the side. This downward pressure lifts the body.

Start with the free arm at the side of the body, then forcibly raise it above the head. This action of exerting upward pressure against the water sinks the body.

Practice bobbing several times by raising the arm overhead pretending that you are "drowning" yourself. Then "save" yourself by forcibly bringing the free arm down to the side of the body.

(2) Sinking the Body by Raising One Arm

Raise the free arm over the head while lightly holding the railing. Test the effect upon body buoyancy.

The essential thing to remember is that one arm held above the head is sufficient to sink the body. Guard against this when floating.

(3) Application of Elementary Back-Stroke Arm Movement for Self-Rescue

A critical situation may necessitate swimming to the surface as quickly as possible. The application of the elementary back-stroke arm movement is effective for quickly regaining the surface when the body is in the vertical floating position.

Face the side of the pool, grasp the railing, assume an upright position. Take a deep breath, raise both arms over the head, which submerges one, then come to the surface by bringing the extended arms forcibly down to the sides of the body. *When the head reaches the surface* grasp the railing.

In the event a second stroke is necessary, *gently* raise the arms over the head to prevent sinking the body again. If a frightened person exerts greater force during the upward movement than on the drive or downward movement the body will remain below the surface. (Refer to page 52, Elementary Back Stroke, Arm-Movement Analysis.)

(4) Application of Sculling-Stroke Arm Movement for Self-Rescue

This stroke is especially valuable as the beginner's safety-valve. The tendency of the excited person is to quicken and widen the stroke and exert pressure up against the water, which would sink the body. By using the sculling stroke the results are less damaging because of the smaller movements and the lessened upward pressure.

The starting position is the same as described for the preceding.

After sinking the body, gently bring the arms straight down to the side, then swim to the surface by using a sculling arm movement and grasp the railing. Bring the hands up along the sides of the body, finishing just above the waist, then bend the wrists and forcibly push down. (Refer to page 60, Sculling Stroke, Arm-Movement Analysis.)

Also practice the combination of Steps (3) and (4); that is, get to the surface by first bringing the extended arm down to the side, finish with a sculling arm movement until the body

reaches the surface, then float or swim. If possible take advantage of a push-off from the bottom.

Even if one could not swim he could save himself by a series of bobbings and floating; that is, sinking the body and regaining the surface (as described in Tests (3) and (4)).

(5) Alternate Pulling Movement for Self-Rescue

This method of reaching the surface also will prove helpful, since one naturally employs a pulling movement to swim up to the surface. The frantic person in his struggle to get air attempts to climb to the surface, but exerts force on the upward instead of the downward stroke, which sinks the body.

Grasp the railing, let go, sink the body. Then come up by using a series of alternate pulling or climbing movements, keeping the palms down, and exerting a pressure from the head to the waist. Accentuate the downward pull. The recovery should be taken very slowly and gently, reaching up with the hand close to the body as though climbing.

One also may regain the surface by using a side- or breast-stroke arm movement. (Refer to page 70, Side Stroke, Arm-Movement Analysis; page 112, Breast Stroke, Arm-Movement Analysis.)

4. IMITATING STRUGGLE OF DROWNING PERSON

It is important that one should attempt to imitate some drowning experiences. This makes a lasting impression upon the novice and should safeguard him against erratic procedure when excited.

(1) Drowning Person Struggle

Grasp the rail, take a deep breath, free yourself and go under. Then pretend that you are "drowning." Frantically struggle to reach the surface by wildly forcing the arms above the head. Also expel the air by calling for help, finally "save" yourself (see Figs. 1, 3, 5 and 6, page 31).

(2) Signaling for Help

Sink yourself, then signal for help by raising one or both arms over the head and hold this position for a few seconds.

Meeting Deep-Water Emergencies: Fig. 1. Raising arms over the head causes choking, sinking or drowning. Fig. 2. Dead-weight of arms above water sinks body. Fig. 3. Saving one's self by bringing arms down to water surface, head back. Fig. 4. Protecting one's self from clutch of another by swimming and warding off with hands and feet. Figs. 5 and 6. When frightened or fatigued float, tread or scull.

The body will remain submerged. "Save" yourself by bringing the arms down to the sides of the body. If frightened, finish with a sculling movement, float or tread water.

5. DEEP-WATER APPLICATION OF EMERGENCY TESTS

In spite of the fact a beginner has passed all of the preceding tests he might still be timid about swimming in deep water, so this step should be practiced properly supervised; that is, having the instructor see that the course is clear and that a correct position is maintained while swimming the stroke slowly and steadily.

(1) Sinking and Saving One's Self and Swimming the Length of the Pool

Face the rail, take a deep breath, sink by raising both arms over the head, "save" yourself by forcibly bringing them down to the side. If the body does not come to the surface after this drive, use a sculling arm movement. At the same time force the head back, with the chin in, this will cause the body to assume the back-floating position. If one is troubled with getting water in the nose wait until you reach the surface before lowering the head. Upon reaching it assume the correct back float. If the legs tend to drag or sink, simply hold the correct position and breathe, soon the body will rise to its floating level (see Fig. 5, page 31). If water is in the air-passages, cough and expel it. While performing this test think, *"Arms down, scull, head back, chin in, then float!"* (The individual who cannot float should start swimming immediately or tread.)

Then, when relaxed and in good position, start swimming down the pool using the sculling stroke (see Fig. 6, page 31). When composed, change to the elementary back stroke, or any stroke desired. Maintain a correct body position and recover gently. When swimming the elementary back stroke remember to recover as slowly and easily as possible during the first two counts, and *especially the second,* so as not to sink the body. Also *keep the chin in and look toward the feet.* These help maintain the correct position and enable one to determine his direction. This step is a preparation for the real test of sinking and saving one's self.

(2) Swimming With Repeated Sinking and Rising to the Surface

First practice this step in the shallow water then apply it in deep water.

Swim a few back strokes, stop, float, inhale, then sink the body by drawing up the knees, bending forward and raising the arms (see Fig. 2, page 31). Regain the surface by bringing the arms down to the sides, scull, then, when the face is free of the water, force the head back with the chin in and straighten the body. Float, clear the air-passages, swim a few strokes (see Figs. 5 and 6, page 31). Repeat this several times.

6. TREADING WATER

This is one of the most important safety measures for the individual who becomes frightened, floats low or who cannot float. When a person becomes excited and struggles to get air the body assumes an upright position, usually resulting in sinking and choking. Treading water would be a most effective means for meeting this emergency. Many circumstances demand the use of this skill, such as life saving, water games, swimming parties, etc.

Grasp the railing, assume the vertical float, then let go and tread (see page 24). Practice treading for a minute or more, using arms alone, legs alone, then both. Then assume a vertical float, sink and recover, tread water, swim, crawl or side stroke. Also practice changing from the back float to the vertical float by flexing the knees, bending the body and scooping the arms forward.

7. EMERGENCY DIVING

Sometimes one may be called upon to dive or jump into the water either as a means of entering correctly or during an accident.

(1) Kneeling Dive and Recovery

Assume a kneeling position at the edge of the pool (see Fig. 1, page 131; Fig. 3, page 125). Dive in shallow water (see Fig. 4, page 125), come to the surface by raising the head and hands. Float face submerged for a moment (see Fig. 1,

page 11), turn over on the back and continue swimming (see Figs. 5 and 6, page 31). Vary this by diving in, regaining the surface, swimming crawl, turning, swimming a few back strokes and continuing with the crawl. (Refer to page 124, Elementary Diving.)

(2) Plain Dive and Recovery

Dive in deep water, come to the surface by raising the head and hands. Or regain the surface by using a breast or side stroke or crawl arm movement, or push off from the bottom if firm. (Refer to page 30, Alternate Pulling Movement for Self-Rescue.)

(3) Jumping Feet First

Either start by standing on the edge of the pool or run and jump in feet first, finishing in a sitting or vertical position. Swim to the surface, using one of the mentioned strokes.

8. CHANGING STROKES AND TURNING

One may know how to swim fairly well but experience considerable difficulty in turning about and in changing from one stroke to another.

Swim part way across the pool, using crawl, then change to the back stroke, and return (without touching any support) using the side or sculling stroke.

Turn right by assuming a sitting or vertical position, pushing back with the left arm and pulling down and forward with the right. If frightened tread water, then change to a stroke. (Refer to page 18, Changing Body Positions.)

9. RELIEVING CRAMP WHILE FLOATING

If one is seized with a cramp in the foot or leg and cannot get out of the water, float on the back or tread water while forcing the leg into the opposite position from that in which it is forced by the cramp. Thus, if the foot is thrown into extension the effort should be made to strongly flex the foot, or assume a sitting posture and attempt to massage the foot.

If the arm is affected float while attending to it, or swim with the legs alone.

10. THE GRASP, THE RELEASE AND SWIM

Usually the novice becomes excited if unexpectedly grasped while in deep water. This test will gradually accustom one to adequately prepare himself to meet this emergency.

(1) Shallow-Water Practice, the Swim and Collision

Start from the opposite side of the pool, swim to the center, using the elementary back stroke. Collide, attempt to grasp each other's arms or body, unlock arms and continue sculling across.

(2) Application in Deep Water, the Grasp and Release

Swim to the center, using a breast, crawl or side stroke. Pretend that you are excited, grasp each other. While in a treading-water position free yourself, using your hands and knees to force your opponent away (see Fig. 4, page 31). (Refer to page 178, Life Saving.)

When first practicing this step do not hold each other very firmly, at least not until you have obtained sufficient confidence and skill in the ways of freeing yourself. (If an emergency demands your immediate release, tap your opponent twice.)

11. SWIMMER'S SAFETY TEST

Swim (at least 300 yards), tread or float for twenty minutes without touching a support. Vary the swim by changing to different strokes or body positions and sinking and "saving" yourself. (If this test is given at a camp, include the Canoe Tests, page 208.)

12. OPEN-WATER SAFEGUARDS

Unless familiar with conditions below the surface, enter muddy water by jumping feet first or in a sitting position.

If one reaches a muddy bottom, do not attempt to push off but swim to the surface, then proceed cautiously.

If one accidentally dives into weeds, regain the surface by making a clearance with the arms using a breast- or side-stroke movement.

If one becomes entangled in weeds or grass while swimming, use either a breast or sculling stroke. Swim slowly, keeping as close to the surface as possible. *Omit using the legs if encumbered.*

If caught in a swift current, do not swim against it but gradually progress in a diagonal course to the shore. If it is impossible to reach the shore, do not give up hope, but float, tread or swim till help arrives.

If when swimming in the surf you feel yourself being carried out by the undertow, do not resist it but recede with it and gradually work your way back to shore by swimming in with the breakers.

Non-swimmers or beginners should not be allowed in canoes until they have passed the deep-water emergency tests and the canoe tests. (Refer to page 208, Life Saving.) Open-water distance swimming should not be allowed without a guard accompanying the swimmer in a boat.

Follow the Leader

This game permits the student to review the various tests and, in his eagerness to follow the leader, he becomes so absorbed in the game he usually forgets his fear.

The leader may start by jumping or diving from the springboard, going through the "drowning struggle," sinking the body, or use any other combination of the tests.

13. BEGINNER'S SAFETY-VALVE

Avoid venturing beyond your depth until you have passed the deep-water emergency tests.

Raising the arms above the head sinks the body. Instead pull for the shore, using an alternate arm and leg movement or the so-called "dog paddle," or swim on the back.

Avoid getting excited when in deep water, float, tread or scull.

Instead of frantically clutching any one when frightened, float, tread or swim to safety.

Avoid getting excited if you should accidentally get a mouthful of water and start choking. Tread water, cough so as to clear the air-passages.

Instead of getting alarmed if the body assumes a vertical

position and is temporarily submerged, quickly bring the arms down to the sides of the body, scull and assume the back float or tread water.

Avoid attempting to change body positions, or turn around, in deep water unless you have first accomplished it in shallow water and can tread.

It is dangerous to canoe alone, or to change seats in a boat or canoe, unless you can take care of yourself while in deep water.

14. SWIMMER'S SAFETY-VALVE

Float, tread or swim on the back when frightened or fatigued.

When seized with a cramp, float and apply treatment, or swim on the back, using the arms if the legs are affected or *vice versa.*

If the body is temporarily submerged place the head back and scull or swim to the surface.

Stop swimming when exhausted, assume a back float or tread and, when rested, continue swimming.

It is safer to swim with a partner.

If clutched by another, free yourself by the release methods used in life saving.

Avoid long-distance swimming unless accompanied by some one in a boat.

If caught in a swift stream, or rip tide, be calm, swim, float or tread with the current.

Avoid struggling when caught in the undertow. Recede with it until the next wave is met, then coast in on it or swim with it and the following ones.

Avoid diving into unknown waters, jump feet first or in a sitting position.

Avoid foolishly rolling a boat or canoe, or changing seats.

Do not take out a canoe unless you can paddle, take care of yourself if overturned, right it, or swim at least a quarter of a mile, float or tread.

Avoid swimming for at least two hours after eating.

If suffering from the effects of heart trouble, consult a doctor before attempting to swim.

(Learn the important release, rescue and resuscitation methods as taught in Chapter IX, page 169, Life Saving.)

Faults and Their Correction

1. Preliminary Tests

(Refer to Faults and Their Correction in Chapter I for the work included in these tests.)

2. Testing Body Buoyancy in Vertical Position

Starting the vertical float with the head forward, arms raised above the water or insufficient air results in slightly submerging the body, which makes it impossible to breathe. Correct by forcing the head well back with the chin up, arms side horizontal, resting on the water surface, and either hold the breath or breathe naturally.

If during Test (3) one holds the arms rigid while the body is submerged, he is unable to rise to the surface. Correct by relaxing the arms while holding on, thus permitting the water to buoy the body to the surface.

3. Testing Effect of Changing Arm Positions While Floating Vertically

Attempting to raise and lower the body by using a fast, jerky arm movement interferes with an accurate testing. Correct by exerting a steady pressure during the drive, and using a slower recovery.

Regaining the surface by forcibly raising the arms over the head sinks the body. Correct by slowly and gently extending the arms and applying force only on the downward movement.

Attempting to scull to the surface without bending the wrists on the downward stroke does not exert enough pressure against the water to lift the body.

While climbing to the surface guard against exerting force during the upward movement, for it sinks the body. Correct by accentuating just the downward or pulling movement.

5. Deep-Water Application of Emergency Tests

Sometimes a novice becomes frightened while attempting to regain the surface. He finds that the first stroke is not sufficient, he struggles, exerting pressure on the upward movements instead of the downward, thus sinking himself. Correct by forcibly bringing the extended arms down to the sides, *then, if necessary, continue sculling.*

While assuming the floating position the beginner may either force the head too far back, which submerges the face, or hold it too far forward, which sinks the feet. Correct by having the back of the head resting in the water, ears submerged and *look* toward the feet.

If one starts swimming with the body in a faulty floating position, or while choking, a frantic reaction and increased sinking usually follows.

Correct by first assuming the proper floating position (or treading water), clearing the air-passages, then, when calm, start swimming.

After sinking the body the beginner sometimes tries to regain the surface by just bringing the arms down and not straightening the body, this results in a poor position. Correct by bringing the arms down to the sides, finish with a sculling stroke and forcibly extend the legs, straightening the body.

If you become excited and go under while making this test remember: "Arms down, scull, head back, chin in and, when at the surface, float or tread water until you are composed and ready to resume the swim."

6. Treading Water

Treading water by moving the arms forward or backward or in any position without the downward pressure will not support the body in place. Correct by applying the modified sculling arm movement with a continuous downward pressure.

Using a fast, jerky leg action and exerting force during the recovery is fatiguing and does not give sufficient force. Correct by accentuating the drive and executing the movements slowly and steadily.

7. Emergency Diving

Remember that one can easily come to the surface by simply raising the *head* and hands upward, since this directs the body and the momentum gained from the dive brings it to the surface.

If one dives too deep and forgets to turn the head and hands up, he is likely to strike the bottom or lose his momentum. Regain the surface either by pushing off or swimming.

8. Changing Strokes and Turning

In the process of turning the novice often becomes alarmed as his body assumes a vertical or sitting position. Correct by first treading water, then turn by pulling down and under with one arm while you force back with the other.

9. Relieving Cramp While Floating

In case of a cramp in the foot or legs remember to calmly assume the back float and apply the proper treatment of massaging or forcibly extending or flexing the legs (depending on which condition caused the cramp), or swim to shore with the arms alone.

10. The Grasp, the Release and Swim

When first attempting the grasp in deep water avoid holding each other too tightly until you have become accustomed to meeting this emergency and releasing yourself effectively.

If unexpectedly seized, tread water, break the grasp by forcibly extending the knees and arms, thus pushing your opponent away.

Review Questions

1. Do you believe the ability to swim across a pool is sufficient preparation to enable you to take care of yourself in deep water? Why?
2. What effect would a vertical position in deep water have upon your buoyancy? Explain.
3. What would happen to you if you were under water three or four feet, in a vertical position, while holding your breath?
4. If you were submerged to a five- or six-foot depth, felt yourself exhausted and had an inadequate supply of air, how would you reach the surface?
5. If an emergency demanded that you reach the surface quickly, what would happen if you brought your arms up forcibly during the recovery of the stroke?
6. What effect has holding one or both arms above the water surface upon your buoyancy?
7. If you were unexpectedly thrown into deep water, and could not swim, what would you do?
8. What would you do to assume a back float upon reaching the surface?
9. If you wanted to sink the body in a vertical position while swimming on the back, what would you do?
10. If you were choking while swimming in deep water, what would you do?
11. Why should one learn how to tread water?
12. What is the most effective way of treading water?
13. Why should a novice practice diving and jumping in the deep water?
14. Describe the safe and correct way of entering the water? Why?
15. What are the various ways of regaining the surface after a dive?
16. If you were forced to dive into muddy or unknown waters, how would you proceed and why?
17. What would you do if you went under while attempting to turn around in deep water?
18. What would you do in case of cramps?
19. How would you free yourself if some one grasped you unexpectedly while swimming in deep water?
20. Suppose that you became entangled in seaweed or grass while swimming, how would you free yourself?
21. What would you do if you felt yourself being carried out by an undertow?
22. What would you do if while in a boat or canoe it overturned?

CHAPTER III

SWIMMING FOR CHILDREN

When teaching little folks to swim it is first necessary to obtain their whole-hearted interest and response. This is accomplished by relating interesting, true or fanciful stories pertaining to the sea or animal life and making appropriate comparisons showing, for instance, how the child, when playing and swimming in water, really emulates a seal or a dog. Also call upon the children to enter into the story and the discussion. Ask them questions relating to the story such as: In what way do we resemble seals? Have any of you ever been to an aquarium and watched the seals breathe? Do we breathe like seals? What can we use for fins? Where are our fins? Questions of this nature stimulate the children to think and they become eager to get into the water and imitate the animals, thus applying the lesson.

When the children enter the water initiative and courage are developed through imitative story-play.

Before attempting to teach children to swim it is first necessary to help them to overcome their fears and prepare them by teaching breath control, breathing and floating.

They are now ready for their first stroke. Since the natural inclination of the child is to strike out in a prone position, with the head raised, the dog paddle is best adapted to its needs. This stroke can be learned in a few lessons.

The sculling stroke should be taught next, since the leg action is somewhat similar and it will serve as the child's safety-valve when frightened or fatigued. The seal stroke or elementary back stroke may be substituted or used interchangeably, as it affords the child another means of propelling itself on its back, and some children prefer it to the sculling stroke.

Finally perfect the preliminary crawl and the crawl. Others will find it easier to proceed from the preliminary crawl to the side stroke, then, eventually to the crawl.

1. CHILDREN'S FIRST LESSONS

Bobbing Seals

Exercise 1. Seals Bobbing Their Heads.

Seals circle round,
Then up and down.

Repeat three times, on the last down go under. This rhyme may be sung by the children to the tune of "Ring Around a Rosy."

Exercise 2. Seals Looking for Fish.

Duck the heads, open the eyes, and look for objects. (Refer to page 1, Preliminary Steps for Inspiring the Novice With Confidence; page 2, Breath Control.)

Seals Coming Up for Air

Exercise 1. Seals Breathing.

Like seals, breathe in through the mouth and out through the nose, you know.
No water we will swallow and great bubbles will we blow.

Breathe in through the mouth, above the water; out through the nose, under water. (Refer to page 5, Learning to Breathe Correctly.)

Seals Float, Glide and Dive

Exercise 1. Seals Floating and Resting.

Our body, you know, is like a seal or a boat,
You fill your air-tanks then you can float.

Grasp the railing, breathe in, duck the head, and lie flat on the water surface, body straight. (Refer to page 8, Face-Submerged Floating and Regaining Standing Position.)

Exercise 2. Seals Stand After Floating.

The seal has been floating and now he wants to stand,
He straightens his body and walks out on the land.

Grasp the railing, duck the head, quickly bring the arms down to the bent knees, place the feet on the bottom, stand. (Refer to page 8, Regaining Standing Position From Face-Submerged Floating.)

Exercise 3. Seals Floating and Resting.

Take the same position as described in *Exercise 1.* Then let go the railing, float, stand unassisted.

Exercise 4. Seals Gliding on Face.

Place one foot against the side of the pool, rest the extended arms on the water. Inhale, duck the head, push off, glide, then stand. (Refer to page 88, Preliminary Crawl.)

Exercise 5. Seals Floating on the Back.

Stand with shoulders submerged, arms sideward, lean back until the head rests in the water, straighten the body, float. Then stand. Or you may practice floating with a partner.

Exercise 6. Seals Stand After Floating.

The starting position is the same as described in *Exercise 5.* Bend the knees to sink the hips, inhale, bend the body, duck the head while scooping the arms forward. Place the feet on the bottom of the pool, stand. (Refer to page 14, Regaining Standing Position from Back Floating.)

Exercise 7. Seals Turning in the Water.

Float on the back, turn over to the face-float position and *vice versa.* (Refer to page 18, Changing Body Positions.)

Exercise 8. Seals Gliding on Back.

Grasp the railing, place the feet against the side for support. Inhale, then slowly and easily push away, glide, stand. Combine this with the back crawl kick.

The Progressive Steps for Learning or Teaching Any of the Strokes to Children Are:

(1) A story or dramatization of the stroke.

(2) Land or water practice of the movements of the coördinated stroke.

(a) Standing, sitting or lying about the pool.

(b) Standing or supported in the water by wings or a partner.

(3) Swim the coördinated stroke.

(4) Refine details of the stroke.

2. DOG PADDLE

Land and Water Practice

Little Dogs Swimming, Using Their Legs

Knees straight, toes pointed in, now kick.
The thrash must be short and quick.

Start with the arms in front of the head, body straight, inhale, duck the head, push off, kick the legs, then stand.

Little Dogs Swimming Using Their Front Paws

Pull back your left paw, reach forward your right.
Then swim, little one, swim with all your might.

Stand in shallow water, start an alternating arm paddle by forcibly pulling down and under with the right arm, at the same time bending and reaching forward just under the water with the left arm.

Little Dogs Swimming, Using Their Front Paws and Legs

Pull and bend while you kick.
Putting power in every lick.

Swim the dog paddle combining the arm and leg movements. Keep the head raised while breathing. (After this is learned, refer to page 86, Preliminary Crawl.)

3. MINNOW STROKE OR SCULLING STROKE

Land and Water Practice

Little Minnows Using Their Front Fins

Hands up along the side,
Bend the wrists, push and glide.

First practice the arm movement standing, then start from a floating or back push-off position and swim across the pool.

Little Minnows Using Their Back Fins

Knees straight, toes pointed in, now kick,
The thrash must be short and quick.

While sitting about the pool, or holding the rail, practice the back crawl kick.

Little Minnows Using Front and Back Fins

Push with the hands and kick,
The movements are short and quick.

(Practice the arm and leg movements as described on page 60, Sculling Stroke.)

4. SEAL STROKE OR ELEMENTARY BACK STROKE

Land and Water Practice

Seals Swimming on Their Backs, Using Their Arm Flippers

Up easy, out and full,
You swim when you pull.

Like the seals using their arm flippers, we slowly bring our hands up to the shoulders, out to the side, then forcibly pull down to the body and glide.

Seals Swimming on Their Backs, Using Their Leg Flippers

Hold the legs together, stretch out, then close;
Breathe in through the mouth and out through the nose.

While grasping the rail practice holding the legs straight and together, then slowly spreading them to the side and forcibly bringing them together.

Seals Swimming on Their Backs, Using Arms and Leg Flippers

Arms and legs up, out and full,
You are swimming when you pull.
Like a seal on its back
You're swimming when your flippers crack.

(For a detailed description and method of procedure refer to page 49, Elementary Back Stroke.)

(Refer to Chapters I (page 1) and XI (page 227) for children's games.)

CHAPTER IV

ANALYSES OF THE VARIOUS SWIMMING STROKES

Because of differences in strength and coördinative ability it is best not to advocate just one stroke for all beginners. Adapt the stroke to the individual and not the individual to the stroke.

It is wrong to place all individuals in the same class, to claim that every one, from six to sixty, can readily adapt themselves to any particular stroke. Such a procedure "lock-steps" the teaching of swimming and is contrary to the best educational thought.

Those who advocate this method fail to recognize the fact individuals vary with regard to their mental and motor (or physical) responses. To illustrate: assign any average class the crawl, granted that all individuals have given it about the same preparation and practice, you will find a marked difference in their ability to swim the stroke. Let us take the highly mental type, for example, who, in his mental endeavors, has slighted all forms of physical activity; he excels in his theoretical analysis of the stroke but usually lacks the ability to think in a motor way or to coördinate the movements of the crawl readily. Then again there is the apathetic type who does not concentrate upon the analysis of the movements, who, consequently, has a hazy idea of the stroke, which is exemplified in his indifferent manner and faulty execution. There is too the individual who symbolizes the average in his mental and motor responses and is able to coördinate the stroke fairly well. Lastly, there is the exceptional student who is able to concentrate upon his work and carry the ideas over into action almost perfectly.

Even though the coach has taught the class how to study the stroke—to think in a motor way—the curve of individual variation will always be present. Therefore a consideration of three main essentials is necessary for the learning and for the teaching of swimming; namely, the student's physical strength,

his coördinative ability and his objective. These factors will determine which stroke is best suited to him.

After years of experience in teaching large classes of college, high and elementary school students, as well as mass work at camps, clubs and recreational centers, the following general conclusions have been reached regarding the reactions of students to the strokes and the methods of procedure for learning or for teaching swimming:

Progressive Steps for Children Six to Ten Years of Age

1. Preliminary steps for gaining confidence.
2. Dog paddle.
3. Back or sculling stroke (as a safety measure).
4. Preliminary crawl or side stroke.
5. The crawl.

Progressive Steps for the Majority of Men and Women

1. Preliminary steps for gaining confidence.
2. Preliminary crawl.
3. Back or sculling stroke (as a safety measure).
4. The crawl.
5. Then learn the other strokes, especially the side stroke, for life saving.

Progressive Steps for Those Who Find the Crawl Too Difficult

1. Preliminary steps for gaining confidence.
2. Back or sculling stroke (as a safety measure).
3. Side stroke.
4. Single overarm stroke.
5. Trudgen, trudgen crawl or the crawl.

Most individuals, and especially children, adapt themselves readily to the "whole" method which is the most natural way of learning to swim. It is suggested under Group I of the strokes listed in this chapter.

Elementary Back Stroke

The majority of students learn the elementary back stroke quickly and can usually perfect it in a few lessons, because it is the simplest of coördinated strokes. However, a few experience some difficulty at first because they lack buoyancy. For this group the sculling stroke is more effective, because the rapid

and continuous arm and leg action offers greater support to the body.

Sculling Stroke

This stroke can be learned as quickly as the back stroke, but it is not as restful. Some find difficulty in mastering the leg action.

Preliminary Crawl

When the crawl was taught as a beginner's first stroke the results of the first few lessons were gratifying. The majority could combine the arm and leg movements satisfactorily but when it attempted to breathe while swimming the coördinated stroke it experienced great difficulty. However, those who naturally adapted themselves to the stroke made rapid strides.

The perfected crawl enables one to exploit his power to a greater degree than with any other stroke. But to reach this goal requires months, even years, of constant practice, with special expert coaching.

Side Stroke

Most individuals who were discouraged or failed with the crawl were able to acquire the side stroke with apparent ease, then progressed to the single overarm and the crawl.

Breast Stroke

This stroke proved to be the least effective and least desired as a beginner's first stroke. But when the crawl was learned first, then most swimmers mastered it easily.

1. ELEMENTARY BACK STROKE

The elementary back stroke is most valuable as a means of resting the body and serves the novice as a safety measure while swimming in deep water. The leg movement also may be used in one of the life-saving carries.

Because of its simple coördination, this resting back stroke (which can be learned in a lesson) is one of the easiest of strokes to master. After one has overcome the initial fear of the water, is able to breathe correctly and float on the back, it is easy to perform these very elementary arm and leg movements.

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.
(2) Analysis of the coördinated stroke, land practice.
    (a) Lie on a bench or spring-board, practice the combined arm and leg movements (or substitute (a) of the next step).
(3) Application of the coördinated stroke, in the water.
    (a) Practice the coördinated stroke while being supported by a partner, wings or any other suitable device.
    (b) Swim the coördinated stroke.
    (c) Refine details of the stroke.

GROUP II. Those individuals who prefer learning this stroke by mastering each part separately then combining them will proceed as follows:

(1) Carefully study your assignment and be prepared for a class discussion of the theory and means of obtaining the best results.

(2) Demonstrate your ability to maintain a correct back-floating position while moving the arms to different positions.

(3) Analysis of the arm movement, land practice:
  (a) Standing (or substitute (a) of step 4).
(4) Application of the arm movements, in the water:
  (a) Standing in shallow water, or assume a floating position by grasping the railing with the toes, or having a partner hold your feet.
  (b) Assume the back-floating position, attempt to swim one or two strokes correctly.
  (c) When these strokes have been mastered start from a back push-off and swim across the pool.
(5) Analysis of the leg movements, land practice:
  (a) Sit, reclining slightly backward, hands supporting the body. First practice using the straight leg kick, then employ a slight knee bend, as described in the text (or substitute (a) of step 6).
(6) Application of the leg movements in the water:
  (a) Holding on to the railing, assume a semi-floating position, practice leg movements.
  (b) Or, placing the hands on the bottom of the pool, assume a floating position.
(7) Analysis of the coördinated stroke, land practice:
  (a) Standing (or substitute (a) of Step 8).
(8) Application of the coördinated stroke, in the water:
  (a) Standing in shallow water, practice the combined arm and leg movements.
  (b) Starting from a correct back-floating position, swim two or three strokes.
  (c) When these strokes have been corrected, start with a back push-off and swim across the pool.

Land Practice

Practice the movements of this stroke at home or about the pool. Follow the progression listed and the description under Water Practice (see Figs. 1 to 4, page 51; Fig. 1, page 53).

Water Practice

Back Push-Off

The momentum derived from the push-off is sufficient to keep one afloat, and is the first step for propelling the body.

Elementary Back Stroke. Fig. 1. Starting position and finish of *Count 3*. Fig. 2. Mid-position of *Count 1*. Fig. 3. Finish of *Count 1*. Fig. 4. End of *Count 2*.

Starting Position: Face the side of the pool, grasp the railing, submerge the shoulders. Place the feet against the side of the pool or support, and as near the water surface as possible (see Fig. 1, page 55).

Push-Off: Take a deep inhalation, let go the railing, finish with the arms at the side of the body (see Fig. 2, page 55). At the same time gradually extend the legs, look toward the feet, while assuming a correct floating position.

Regain standing position or swim.

Breathing

If one is desirous of timing the breathing with the stroke, inhale through the mouth during the interval of *Count 1* and exhale through the nose during the interval of *Counts 2, 3* and *4*. Otherwise breathe naturally and when necessary.

Arm-Movement Analysis

Starting Position: Start the arm movements with the extended arms and hands close to the sides of the body.

Count 1. The index fingers *slowly* follow the seams of the bathing-suit until the hands reach the shoulders, *elbows back and in.*

By bringing the hands up along the seams of the bathing-suit, below the water surface, the possibility of splashing water in the face is eliminated. By recovering slowly and by keeping the elbows back and in, close to the body, resistance is minimized (see Figs. 1, 2 and 3, page 51; Fig. 3, page 55; Fig 1, page 57).

Count 2. *Slowly* extend the arms diagonally upward.

It is imperative that you move the relaxed arms slowly to this position so as not to impede progress or sink the body (see Fig. 4, page 55; Fig. 2, page 57).

Count 3. Bring the extended arms down to the sides of the body, using a *steady surface pull.*

Starting with the arms diagonally upward, instead of side horizontal or vertical, gives greater propelling power (see Fig. 2, page 57). By using a surface pull (starting with the thumbs up), instead of one that scoops deeply (starting with the palms down), the possibility of pulling the body under is eliminated and greater power is attained (see Fig. 4, page 55).

Elementary Back Stroke (Continued): Fig. 1. Land practice, start of *Count 3.* Fig. 2. Application of land practice, standing in water, start of *Count 3.*

Count 4. Glide.

Assume starting position, glide forward on the momentum gained (see Fig. 3, page 57).

Leg-Movement Analysis

Starting Position: Stand with the back to the side of the pool, submerge the shoulders, hold the railing with an overhand grasp. Assume a semi-floating position by bracing the neck and back against the side of the pool.

Count 1. With the *heels touching,* slightly bow the knees outward, spreading them about eight inches.

This position is necessary to minimize resistance, since one avoids sinking the hips as well as the dragging of the lower part of the legs (see Fig. 3, page 55; Fig. 1, page 57).

Count 2. Flex the ankles, slowly extend the legs outward, finishing with the heels about thirty inches apart.

This flexed position of the ankles permits one to exert a slight pressure against the water, which helps to propel the body forward (see Fig. 4, page 55; Fig. 2, page 57).

Count 3. Close the extended legs forcibly.

It is necessary to use force during this count so as to obtain the maximum propelling power during the leg drive (see Fig. 3, page 57).

Count 4. Glide.

Glide forward with the legs extended, heels and knees touching (see Fig. 3, page 57).

Important Note: In learning or teaching the coördinated elementary back-stroke leg movement, first practice it with the legs held straight during the four counts; that is, hold them together during the interval of *Count 1* (see Fig. 3, page 57), spread them during the interval of *Count 2* (see Fig. 2, page 57) and close them forcibly during the interval of *Count 3* (see Fig. 3, page 57). By following this procedure one avoids the tendency of a marked knee and hip flexion, which tends to sink the body and increases resistance.

Coördinated Stroke Analysis

The coördination of the elementary back stroke consists of the combination of the arm and leg movements according to *Counts 1, 2, 3* and *4.* To obtain satisfactory results when

Elementary Back Stroke (Continued): Fig. 1. Start of back push-off. Fig. 2. Glide of back push-off or start of *Count 1.* Fig. 3. Finish of *Count 2.* Fig. 4. Nearing mid-position of *Count 3,* also showing correct hand position for surface pull.

learning this stroke, swim very slowly and rhythmically while thinking and carefully applying the following directions:

Count 1. *Heels together* until the hands reach the shoulders, *elbows back and in.*

Count 2. *Slowly* extend the arms and legs outward.

Count 3. Execute *surface pull* with arms, *snap legs together.*

Count 4. *Glide.*

(See Figs. 2, 3 and 4, page 55; Figs. 1, 2 and 3, page 57.)

Faults and Their Correction

Holding the breath while concentrating on the stroke (or because of timidity) causes fatigue and tension. Correct by consciously timing the breathing and relaxing.

Swimming with the head held too far forward is tiring and causes the legs to drag. Correct by lowering the head until the ears are covered, and slightly raising the chin.

Holding the head too far back or exaggerating the backward arched position of the body submerges the face and causes body rigidity. Correct by keeping the chin in and *looking* toward the feet.

Swimming the elementary back stroke with the hips flexed or in a semi-sitting position tends to sink the body, reduce horizontal buoyancy and impede progress. Correct by pushing the hips up and feeling the back arched.

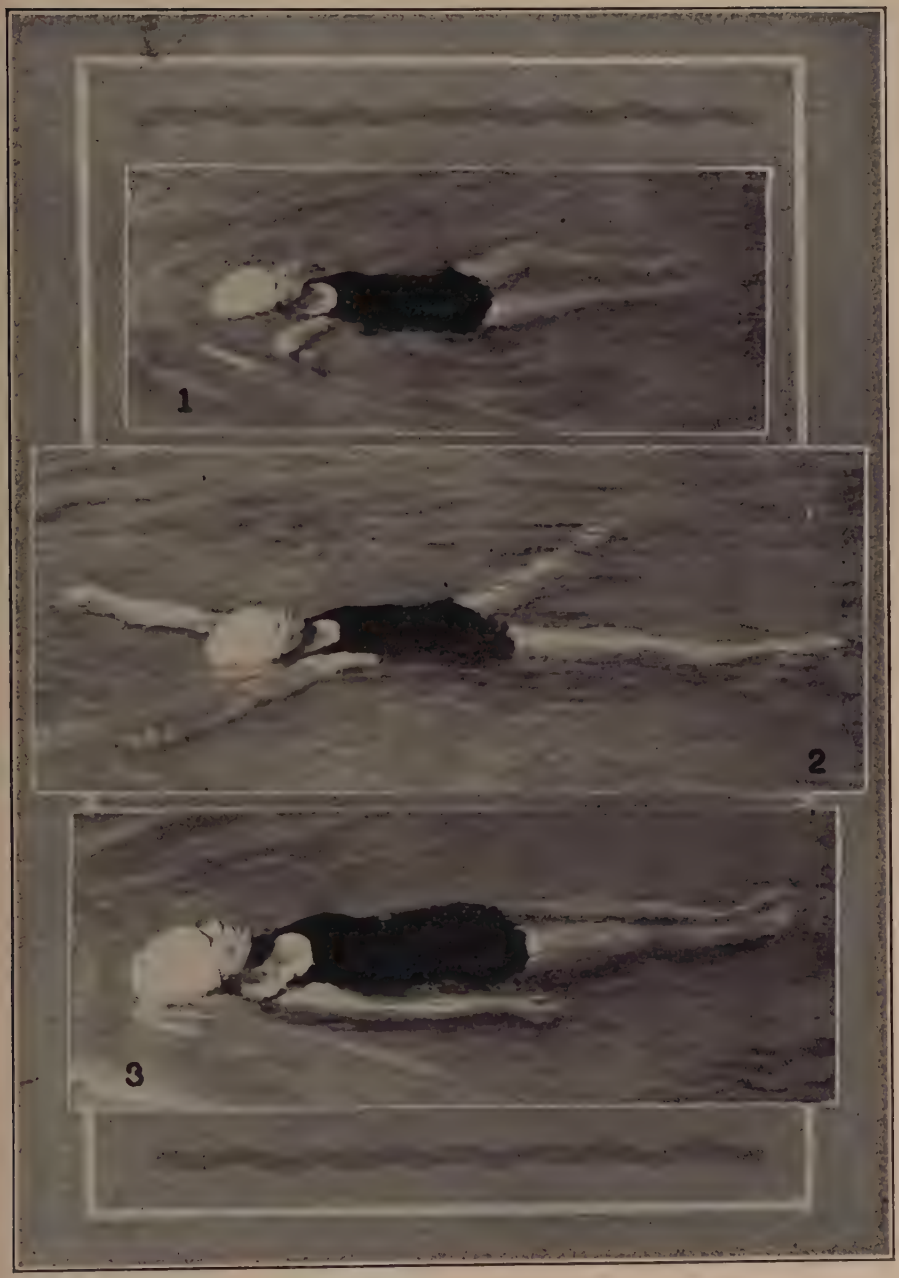
Employing a rapid or jerky movement during the interval of *Count 1,* and especially *Count 2,* impedes progress and sinks the body. Correct by executing these movements slowly and pausing at the end of *Count 2.*

Moving the elbows out to the side instead of keeping them back and in, slightly impedes progress and may interfere with the correct floating position by tending to depress the chest.

Bringing the hands up along the front of the body during the interval of *Count 1,* tends to splash water in the face, which may cause choking. Correct by concentrating upon the proper movement, then verify it by feeling the index fingers pressing firmly against the seams of the bathing-suit.

Starting the drive with the palms resting on the water surface temporarily lifts the head and shoulders above the water, but when pressure is released the body tends to sink. Correct by starting the arm movements with the thumbs up, palms forward.

Bringing the knees forward and upward with a noticeable bend, or recovering with them widely spread, results in a marked flexion and sinking of the hips, which increases resistance and tends to sink the body.



Elementary Back Stroke (Continued): Fig. 1. Heels together until hands reach shoulders, *Count 1.* Fig. 2. Slowly extend arms and legs outward, *Count 2.* Fig. 3. Surface pull with arms, snap legs together, *Count 3.*

Correct by feeling the legs almost extended, heels touching and knees turned slightly outward.

Extending the legs with the toes pointed during the interval of *Count 2* hinders the driving power and causes unnecessary rigidity. Correct by using a marked ankle flexion with a steady pressure against the water at this count.

Bringing the legs together gently and slowly during the interval of *Count 3* decreases the driving power of the leg movement. Correct by executing the movements with a steady and forceful pressure, finishing with the heels together.

Using incorrect timing of the arm and leg movements (that is, having the arm movement precede the leg movement, or *vice versa*) interferes with the proper rhythm of the stroke. Correct by concentrating on the timing of the stroke, checking it; that is, making sure that the arm and leg movements are synchronized.

Review Questions

1. Is it necessary to learn the elementary back stroke? Why?
2. What is the correct way to breathe? Why?
3. Why is it necessary to maintain the correct floating position while swimming this stroke?
4. What is the most effective way of using the elementary back-stroke arm movement? Why? Analyze each count.
5. Why do you consider it necessary to keep the legs straight when first learning this stroke?
6. What is the correct position of the legs during the four counts? Why?
7. What is the correct timing for the coördinated stroke? Why?

Sculling Stroke: Fig. 1. Move hands outward palms down, crawl kick, *Count 1.* Fig. 2. Bend wrists, push down and in, crawl kick, *Count 2.* Fig. 3. Modified sculling, *Count 1.* Fig. 4. Modified sculling, *Count 2.*

2. SCULLING STROKE

The sculling stroke is the beginner's safety-valve, for it helps to prepare him for the various emergencies which might arise while swimming in deep water.

This stroke may be practiced in conjunction with the preliminary crawl, since the leg action is similar and it facilitates the learning of both.

Often the novice becomes discouraged and fatigued when first applying the breathing with the coördinated crawl stroke. If the sculling stroke is used interchangeably it renews the novice's confidence and interest, since this stroke may be learned in a single lesson.

It is especially helpful for the individual who floats low. The rapid and continuous arm and leg action gives support and propelling power. The sculling-stroke arm movement is similar to that used in treading water.

Progressive Steps for Learning or Teaching This Stroke Are:

(The sculling stroke progression is the same as that given for the elementary back stroke, page 49.)

Land Practice

Practice the movements of this stroke at home or while lying or standing about the pool (see Figs. 1 to 4, page 59).

Water Practice

Breathing

Breathe naturally.

Arm-Movement Analysis

Starting Position: Start the arm movements with the relaxed arms near the sides of the body (backs of hands forward, when standing; the palms down, when swimming on the back).

Sculling Stroke (Continued): Class practicing modified sculling stroke to music, start of *Count 2.*

Count 1. Bend the elbows while moving the hands out to the side, with the palms down.

The relaxed arm movement combined with the palm-down position helps to minimize resistance during the recovery or the negative part of the stroke (see Fig. 1, page 59; Fig. 1, page 63).

Count 2. With a quick circular movement, *bend the wrists,* turn the palms forward and *press* down toward the sides of the body.

The quick downward and inward pressure during the interval of *Count 2,* or the drive, propels the body forward (see Fig. 2, page 59; Fig. 2, page 63).

IMPORTANT NOTE: The following is another variation of the sculling stroke which has proved helpful to many: *Recover* with the index or little fingers following along the seams of the bathing-suit until the hands reach the waistline, while keeping the elbows back, this action minimizes resistance (see Fig. 3, page 59). Then start the *drive* by bending the wrists and quickly and forcibly pushing down, a marked wrist bend being necessary to obtain the maximum driving power (see Fig. 4, page 59; Fig. 1, page 61; Figs. 3 and 4, page 63).

Or attempt the sculling stroke by describing a figure eight with the hands, accentuating the downward stroke.

Leg-Movement Analysis

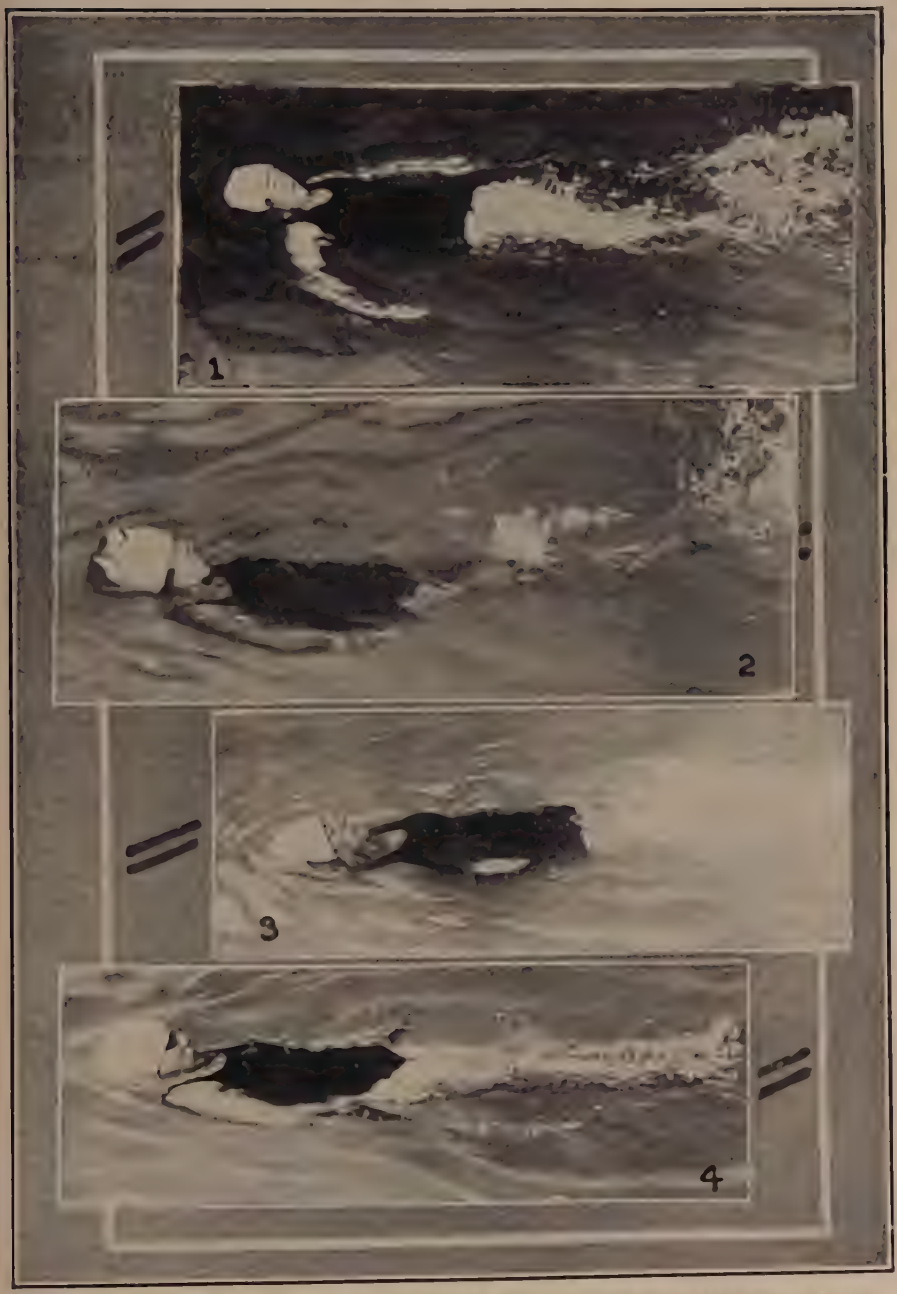
Starting Position: Start the back crawl kick with the legs extended, but relaxed, toes turned in slightly.

Counts 1 and 2. Thrash up and down, alternating while slightly toeing in.

The propelling power is obtained by slightly bending the knees, toeing in and accentuating the upward movement. This forces the water away from you, and drives the body head on (see Figs. 1 and 2, page 59; Figs. 1 and 2, page 63).

Coördinated Stroke Analysis

When first attempting the coördinated stroke concentrate your attention upon the arm movement while using a relaxed, easy leg drive of about ten inches. When this is accomplished, increase the power of the leg drive (see Figs. 1 and 2, page 63).



Sculling Stroke (Continued). Fig. 1. End of *Count 1*, arms out to side, palms down, crawl kick. Fig. 2. Finish of *Count 2*, push down and in, crawl kick. Fig. 3. Modified sculling stroke, *Count 1*. Fig. 4. Modified sculling stroke, *Count 2*.

Counts 1 and 2. With a circular action move the arms out easily, then down and in forcibly while combining the back crawl kick.

Faults and Their Correction

Swimming with the body arched backward tends to immerse the head and retards progress. Correct by relaxing the body and *looking* toward the feet.

Swimming with the body in a sitting position tends to sink it and increase resistance. Correct by slightly arching the back and feeling the hips raised.

Holding the arms stiff, turning the palms out and exerting force during the recovery, or *Count 1,* tends to neutralize the propelling power. Correct by relaxing the arms, bending the elbows and keeping the hands parallel to the water during the recovery.

Executing the drive gently with the palms parallel to the water surface limits the driving power. Correct by turning the palms forward, bending the wrists and executing a forceful downward and inward pressure.

Holding the legs tense and straight neutralizes the driving power and is fatiguing. Correct by relaxing the legs, feeling a slight knee bend, and accentuating the upward movement.

A marked upward knee bend sinks the hips and greatly retards progress. Correct by feeling the body and legs extended and accentuate the upward movement with the toes breaking the water.

A noticeable knee bend, accentuating the downward stroke, checks progress or propels the body in the opposite direction. Correct by extending the legs and accentuating the upward beat.

Too wide a kick decreases the driving power and is fatiguing. Correct by taking a narrow thrash of about six inches.

Timing the arm and leg actions is unnecessary, as it is automatically established when swimming the coördinated stroke.

Review Questions

1. Of what value is the sculling stroke?
2. Why is it necessary to assume the correct back-floating position while sculling?
3. How is the maximum of power obtained from the arm movement? Analyze each count.
4. What is most effective way of executing back crawl kick? Why?

3. SIDE STROKE

The side stroke is one of the most restful ways of swimming and is especially useful in life saving.

Some individuals find the crawl difficult and adapt themselves more readily and effectively to the side stroke, for they can propel themselves with less effort and are not concerned with the problem of breathing. Then they may progress from the side and single overarm strokes to the trudgen or crawl.

The modified side stroke is superior to the one taught with a wide scissors kick and a marked knee bend opening the legs during the interval of *Count 1*, and closing them during the interval of *Count 2*. As a result of various tests the modified side stroke has proved by timing to be faster and comparatively effortless. It is also more effective when used as a life-saving carry. If this stroke is taught with the correct timing it serves as a foundation for the single and double overarm strokes.

(This stroke is analyzed for one swimming on right side.)

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.
(2) Analysis of the coördinated stroke.
    (a) Practice the coördinated stroke in water while being supported by a partner, wings or any other suitable device.
    (b) Swim the coördinated stroke.
    (c) Refine details of the stroke.

GROUP II. Those individuals who prefer learning this stroke by mastering each part separately then combining them will proceed as follows:

(1) Carefully study your assignment and be prepared for a class discussion of the theory and means for obtaining the best results.

(2) Demonstrate your ability to execute a correct side push-off.

(3) Analysis of the leg movements, land practice:
  (a) Lying on the side (or substitute (a) step 4).

(4) Application of the leg movements, in the water:
  (a) Holding on to the railing.

(5) Analysis of the arm movements, land practice:
  (a) Standing, while bending to your swimming side (or substitute (a) of step 6).

(6) Application of the arm movements, in the water:
  (a) Standing in shallow water, analyze first one arm movement, then the other, then both.

(7) Analysis of the coördinated stroke, land practice:
  (a) Standing (or substitute (a) step 8).

(8) Application of the coördinated stroke, in the water:
  (a) Standing, demonstrating correct timing of the stroke, or practice with a partner, ones performing while twos assist by supporting the body in a correct side position.
  (b) First attempt the coördinated stroke by keeping the under arm extended while coördinating the top-arm and leg movements (or substitute (c) of step 8).
  (c) The side push-off with two complete coördinated strokes.
  (d) When corrected, swim across the pool, gradually increase your distance to four hundred and forty yards.

Land Practice

Practice the movements of this stroke at home or while lying or standing about the pool (see Figs. 1 to 4, page 67; Fig. 1, page 69).

Water Practice

Side Push-Off

It is helpful to learn the side push-off in order that the novice may balance the body properly while swimming on the side. The correct side push-off position is maintained by having the weight of the body evenly balanced about its imaginary center line and having sufficient momentum during the glide.

Side Stroke: Fig. 1. Starting position of stroke and finish of *Count 2.* Fig. 2. Mid-position of *Count 1.* Fig. 3. Finish of *Count 1.* Fig. 4. Mid-position of *Count 2.*

Starting Position: First, grasp the railing with the left (or top) hand, place the right hand against the side of the pool to help support the body. Then raise the left arm and *look* toward the feet. This gives the feeling of the correct side balance (see Fig. 4, page 69).

Second, stand with the left side of the body toward the railing, shoulders submerged. Grasp the railing with the left hand, rest the right arm on the water surface, finishing with both arms in a line with each other. Then place the feet against the side of the pool near the water surface. Now rest the right cheek in the water and look at the hand which is holding the rail (see Fig. 2, page 69).

Push-Off: Push the body away from the side of the pool by straightening the flexed legs, while exerting a steady pressure, and at the same time rest the extended left arm on the side of the body. Straighten the body, but do not stiffen it. Keep the arms and legs on a line with the body's imaginary center line and *look down along the front of the body toward the feet.* If the push-off is executed correctly the body glides forward in the side-float position (see Fig. 3, page 69).

The right (or under) arm combined with the correct head position are the chief factors for regulating balance. If the body tends to turn on the back, quickly move the right arm back until the correct side balance is regained. If the body tends to turn forward, bring the under arm forward until proper balance is established.

Regain standing position.

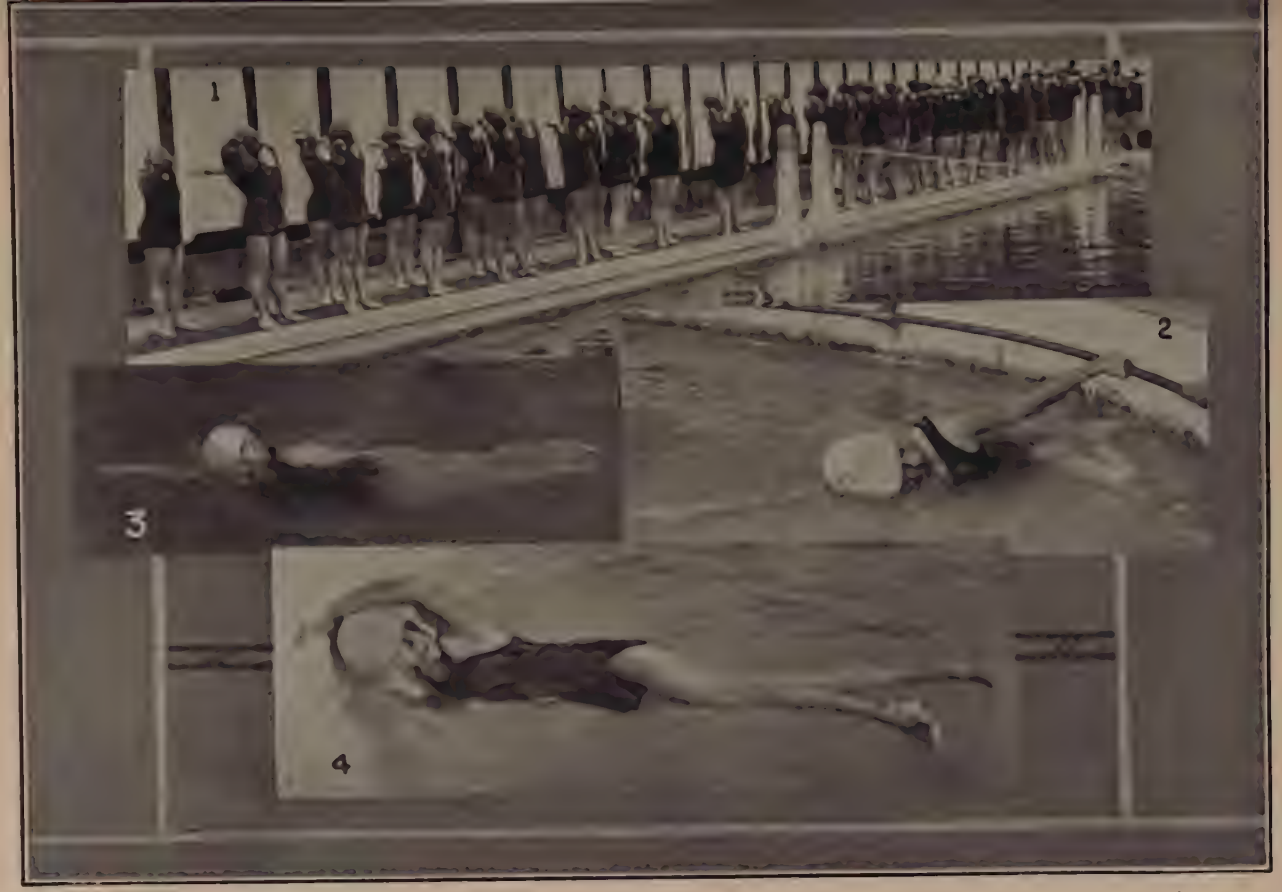
Get up by quickly bending the head and body to the left, at the same time bringing both hands together in front of the body, then place the feet on the bottom.

Breathing

Inhale through the mouth during the interval of *Count 1* and exhale through the nose during the interval of *Count 2.* One may breathe naturally, but it is advisable to breathe in the described manner as a preparation for the double overarm strokes and as a safeguard against choking.

Leg-Movement Analysis

Starting Position: The starting position for the scissors kick is as follows: Stand with the right side of the body facing



Side Stroke (Continued): Preliminary practice. Fig. 1. Class practicing side stroke, start of *Count 1*. Fig. 2. Starting position for side push-off. Fig 3. The glide, maintaining correct balance on side. Fig. 4. Practicing scissors kick, body correctly balanced while looking toward feet.

the side of the pool, submerge the shoulders. Grasp the railing with the left hand, place the palm of the right hand firmly against the side of the pool, about twenty inches directly below the left hand, with the fingers pointing down. Then raise the legs to the water surface and assume a correct side position, body extended, heels and knees touching. Raise the left elbow, bend the head forward, rest the right cheek in the water and *look toward the feet.* While in this position practice the scissors kick (see Fig. 4, page 69).

Count 1. Hold.

Hold the legs together as in starting position during this count (see Fig. 3, page 69).

Count 2. Open easily and close forcibly.

Slowly and easily spread the legs to minimize resistance. Flex the knees slightly to permit relaxation. Finish with the feet about twenty-four inches apart. Make sure that the left (or top) leg moves forward the same distance in front of the body's imaginary center line as the right (or under) leg moves to the rear of it (see Fig. 4, page 69). This equalizes the driving power and aids in maintaining the correct balance. Then forcibly close the legs, finishing with the heels and knees touching, legs straight. The maximum power is derived by forcibly bringing the legs together in this manner. As the legs are closed, the water between them is forced out, thus sending the body forward.

Count 3. Hold.

Arm-Movement Analysis

First Step (Right and left arm movement analysis):

Starting Position: Stand in shallow water (or about the pool), submerge the shoulders, bend to the swimming side. Rest the right arm on the water surface and place the extended left arm at the side of the body, palm touching the thigh.

Right-Arm Analysis: Start the pull or drive by turning the palm of the hand toward you. Then *employ a surface pull,* finishing with the right hand at your near shoulder, elbow low. A surface pull is used instead of a deep straight-arm drive in order to fully exploit one's power, and to avoid the tendency of temporarily lifting the body by pressing down on the water and then sinking it when pressure is released as the hand recovers to the shoulder.

Side Stroke (Continued): Fig. 1. Start and glide, body extended, properly balanced on side. Fig. 2. Nearing mid-position of *Count 1*. Fig. 3. Finish of *Count 1*, feet together until hands touch. Fig. 4. Mid-position of *Count 2*, slowly extending right arm, pulling left, scissors kick.

Start the right-arm recovery by turning the palm forward with the thumb up. *Slowly extend the right arm forward,* near the water surface, finishing in starting position. This recovery position helps to cut the water, thus minimizing resistance, and avoids the costly fault of pushing against it and retarding progress (see Figs. 1 to 4, page 67).

Left-Arm Analysis: Start the left-arm recovery by turning the palm toward the body and keeping the thumb in contact with it until the hand reaches the shoulder. This is a necessary safeguard, because the swimmer tends to swing the top arm around to its catch position thereby destroying balance and slightly impeding progress. Start the drive with the palm down, keep the thumb in contact with the body and continue to pull until the hand reaches the thigh. Pulling close to the body gives greater power and better balance (see Figs. 1 to 4, page 67).

Second Step (Complete arm-movement analysis):

After you have learned each arm movement combine them according to the following counts:

Count 1. Inhale, *surface pull right* while you cross left.

At the finish of *Count 1,* the hands should meet at the right shoulder, with the left on top of the right, as in a prayer position.

Count 2. Exhale, *slowly extend right* while you pull left.

Count 3. Glide.

The body rests on the side as in the side push-off position. (See Figs. 1 to 4, page 67.)

Coördinated Stroke Analysis

First Step (Coördinated stroke analysis, keeping the under arm extended while combining the top-arm and leg movements):

Starting Position: Start from a side push-off and glide.

Practice this step until correct balance and timing are learned. Usually it is difficult for the novice to combine the complete arm and leg movements while attempting to maintain a correct side balance. By using the right arm as a means of regulating balance instead of stroking with it one eliminates the fault of first lifting the body and then sinking it.

Count 1. Recover left, hold the legs together.

Count 2. Pull left, kick.

Count 3. Glide.

SECOND STEP (Coördinated stroke analysis):

When the preceding step has been learned, the complete coördination is comparatively easy. The stroke is executed slowly, especially during the second count, to allow time for the kick. Stress a surface pull with the right arm and its correct recovery so as to cut the water. To check on the timing, think "Heels pressed together until the hands touch, then, when the hands part, execute one small scissors kick, then glide."

If you are attempting to swim the side stroke with the body in a semi-back position, adjust balance by looking toward the feet and by recovering with the right arm back or, if the body turns toward the chest, correct by recovering with the right arm forward until you are able to maintain the correct side balance.

Count 1. Inhale, *surface pull right arm* while you cross left *arm, hold the legs together* (see Figs. 2 and 3, page 71).

Count 2. Exhale, *slowly extend right arm* while you pull left arm, *kick* (see Fig. 4, page 71).

Count 3. Glide (see Fig. 1, page 71).

After balance and correct timing have been established, gradually apply more power. Pull a little deeper with the right arm (that is, starting with the palm down and pulling about ten inches below surface), then bend the elbow and continue the drive toward the shoulder. Refine the details of the stroke and attempt frequent swims, gradually increasing your distance.

FAULTS AND THEIR CORRECTION

Moving the head too far forward or backward tends to tip the body in the direction the head is turned. Correct by looking toward the feet.

Swimming with one or both arms wide of the body's imaginary center line tips the body in the direction of the greatest weight, to illustrate: If the under arm is back and perhaps the top arm forward, the body will be thrown forward. Correct by moving the right (or under) arm forward close to the surface. If the body tips to the back because the under arm is forward correct side balance will be lost. Correct by moving the under arm back.

If the right arm is not resting on the surface but is held under the body it will result in lack of support and one will lose effectiveness in

regulating balance. Correct by having the under arm resting on the water surface and relax.

Raising the left (or top) arm above the water tends to sink the body. Correct by having it rest on the body.

Using a forceful, deep right-arm drive momentarily lifts the body then, when the pressure is released, it tends to lower or sink the body. Correct by using a steady surface pull.

Turning the palm out and forcibly pushing against the water during the right-arm recovery retard progress and tend to sink the body. Correct by slowly executing the arm recovery with the palm forward, *thumb up*.

Using a wide circular movement with one or both arms results in a faulty position, increases resistance and lessens the driving power. Correct by pulling in line with the body's center line and close to it.

Using a marked knee flexion with a wide spread acts as a brake to the stroke and is wasted effort. Correct by using a narrow kick with just enough bend in the knees to give relaxation.

Exerting force during the recovery increases the resistance. Correct by gently spreading the relaxed legs.

Lifting the top leg during the recovery tends to sink the body and is wasted motion. Correct by feeling the thighs close together during the interval of *Count 1*.

Executing *Count 2* by not completing the drive (that is, failing to close the extended legs) results in lost power.

Failing to finish the drive with the feet together (that is, permitting them to drift apart after the closed position) is a waste of energy and interferes with the timing. Correct by feeling the feet pressed together at the finish of *Count 2*.

Employing an incorrect timing of the arm and leg action (that is, drawing the legs up or spreading them as the top arm recovers) results in increased resistance and waste of energy. Correct by swimming a few strokes with the arms alone, feeling the legs pressed firmly together. Then swim the coördinated stroke feeling the heels pressed together until the hands touch, then execute a small scissors kick as the hands part.

Swimming the side stroke with an uneven rhythm (that is, taking the second count much faster than the first) lessens the driving power of the second count and makes for a jerky stroke. Correct by taking the second count very slowly and holding the third count or swimming to music, following an even rhythm.

Review Questions

1. Why is the side stroke important?
2. What factors contribute toward maintaining correct balance? Why?
3. If one assumes a faulty position, how is it corrected? Why?

4. Which gives the greatest propelling power, a small scissors kick with a slight knee bend or a wide spread scissors kick with marked knee flexion? Why?

5. Should one expend the same amount of energy during the opening and closing of the legs?

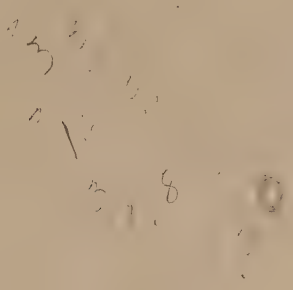
6. Do you consider that the surface pull of the right arm is superior to a deep drive? Why?

7. Why is it necessary to turn the palm of the right hand forward, with the thumb up, during its recovery?

8. What effect has a wide circular arm movement upon the balance and driving power of the stroke?

9. Why should one wait until the second count before executing the scissors kick?

10. How can you tell whether you are swimming the side stroke correctly timed?



4. SINGLE OVERARM STROKE

After one has learned the side stroke he should logically progress to the single overarm stroke. The only difference is that in this stroke the top arm recovers out of the water. Most individuals find the single overarm stroke easier and more effective because of the top-arm recovery above the water.

The single overarm stroke may serve as a transition stroke in learning the double overarm strokes and crawl.

(This stroke is analyzed for one swimming on right side.)

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.
(2) Analysis of the coördinated stroke.
    (a) Practice the coördinated stroke in water while being supported by a partner, wings or any other suitable device.
    (b) Swim the coördinated stroke.
    (c) Refine details of the stroke.

GROUP II. Those individuals who have learned the side stroke and wish to master the single overarm stroke proceed as follows:

(1) Study your assignment.
(2) Analysis of the arm movements:
    (a) At home, standing about the pool or in the shallow water, analyze one, then both arm movements.
(3) Analysis of the coördinated stroke:
    (a) Swim the coördinated stroke by first executing the top-arm recovery with the relaxed forearm and hand close to the surface, elbow resting in the water, then recover with the arm just clearing the water surface.

(b) Swim the single overarm stroke with the correct top-arm recovery. Gradually refine details of the stroke when swimming and increase your distance.

GROUP III. Those individuals who have learned a double overarm or crawl stroke and wish to master the single overarm stroke proceed as follows:

(1) Study your assignment.
(2) Learn the side push-off.
(3) Execute the side push-off with a correct scissors kick.
(4) Analysis of the complete arm movements, land and water practice.
(5) Analysis of the coördinated stroke, then swim.

LAND PRACTICE

Practice the correct technique of the arm movements at home or about the pool.

WATER PRACTICE

Breathing

Inhale through the mouth during the interval of *Count 1*, exhale through the nose during the interval of *Count 2*.

Leg-Movement Analysis

(See page 68, scissors kick.)

Arm-Movement Analysis

FIRST STEP (Right, then left, arm-movement analysis):

Starting Position: Stand in shallow water, submerge the shoulders, arms extended in the side-stroke position, palms down, resting on the water surface.

Right-Arm Analysis: Start the drive by exerting a downward pressure on the water of from six to ten inches. This helps to support the body while the top arm is recovering. Bend the elbow and bring the hand to the chest, or shoulder.

Slowly recover with the palm down or forward, finishing in starting position.

Left (or Top) Arm Analysis: Start the *recovery* by quickly bending the elbow without moving it forward, the arm raised

sufficiently to clear the water surface. Finish with the hand near the chest, fingers pointing forward in the direction that the arm is about to be extended (see Figs. 1 and 3, page 79). Then slowly straighten the relaxed arm forward, just above the water surface, and finish near the right shoulder, palm down, elbow slightly elevated, ready for the pull. By recovering in this manner one is afforded greater relaxation and economy of movement.

Pull the hand down through the water near the body with the flexed elbow leading. After the arm passes mid-drive position, cut the water by turning the back of the hand forward, little finger up. As the hand clears the water, recover with it in this position or turn the palm down, resting the relaxed arm and hand on the water surface.

When analyzing the top-arm movement think "Quickly bend, slowly extend, pull, swing out and cut (or flip)."

Second Step (Complete arm-movement analysis):

When you have learned each arm movement, combine them according to the following counts:

Count 1. Inhale, pull right arm while you bend and slowly extend the left arm forward above the water.

At the finish of *Count 1,* the hands do not meet at the right shoulder, as in the side stroke, but they pass, the top hand going a bit beyond the right shoulder while the under arm approaches the chest.

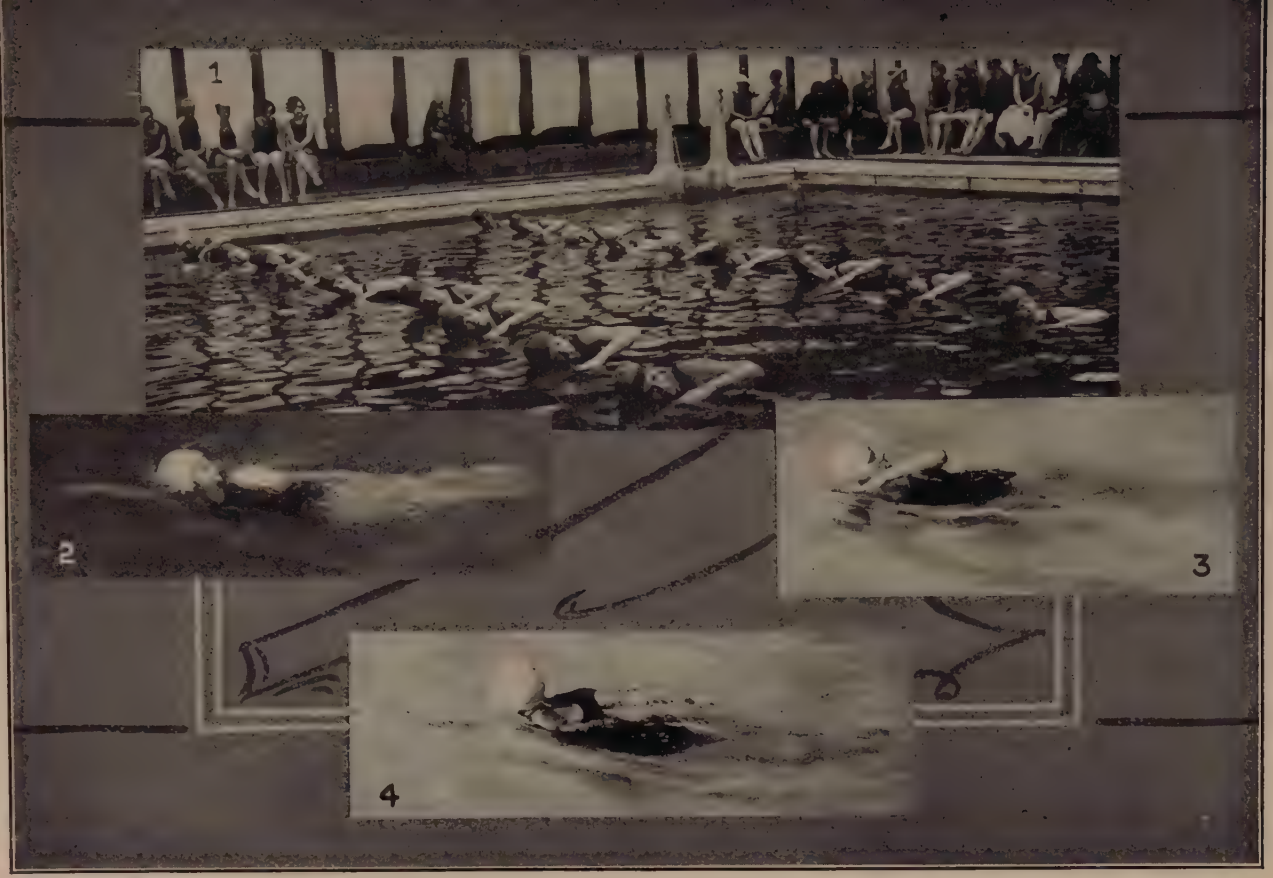
Count 2. Exhale, pull left arm while you slowly extend the right arm.

Coördinated Stroke Analysis

Start from the side push-off and execute the arm and leg movements as described in the preceding steps.

Be sure that you start the top-arm recovery with the palm down or forward, *relaxed arm just clearing the water surface.* Those who find difficulty in mastering this recovery should first attempt it by keeping the elbow in the water and just move the relaxed hand and forearm forward. Then recover with the arm raised sufficiently to clear the surface.

After correct balance and timing have been learned, perfect details of the stroke, and gradually increase your power and endurance through distance swimming.



Single Overarm and Trudgen Strokes: Fig. 1. Class practicing single overarm stroke, nearing end of *Count 1.* Fig. 2. Start and glide of stroke Fig. 3. End of *Count 1,* pulling right, recovering over left, feet together. Fig. 4. Trudgen stroke, start of *Count 2.*

Count 1. Inhale, pull right arm while you recover over left arm, holding the legs together.

Count 2. Exhale, pull left arm, while you slowly extend right arm and kick (see Figs. 1 to 3, page 79).

Faults and Their Correction

(Balance, body and leg faults are the same as listed for side stroke.)

Starting the top-arm recovery with the palm up causes muscular tension. Correct by starting with the palm down, hand limp.

Recovering by forcibly swinging the extended arm forward results in a faulty body position and is a needless expenditure of energy. Correct by first quickly bending the elbow, then slowly extend the arm forward.

Starting the recovery by raising the elbow and hand high above the water tends to submerge the face and causes an unnecessary strain. Correct by starting the bend with the elbow in the water. When this fault is overcome, recover correctly.

Recovering by dragging the arm through the water, especially with the elbow low and hand high, offers resistance. Correct by first raising the elbow so that the arm will clear the water surface.

Finishing the top-arm recovery by overreaching results in poor balance, while cutting the stroke limits the drive. Correct by slowly extending the relaxed arm close to the body, finishing with it near the right shoulder.

Applying force at the end of the drive, finishing with the hand raised high above the water, is a needless expenditure of energy. Correct by exerting force at the start of the drive, then gently bringing the arm to the surface and, as the little finger emerges from the water, turn the relaxed hand, palm down.

Taking a deep, straight-arm pull with the right (or under) arm first lifts the body then propels it forward and finally tends to sink it because of the released downward pressure and final upward force against the water. Correct by starting the drive with a six- or ten-inch downward movement, then bring the hand to the shoulder and just under the water.

Review Questions

1. Why is it helpful to turn the palm down before starting the top-arm recovery?
2. Should one bend the elbow before starting top-arm recovery? Why?
3. What is the correct catch position? Why?
4. Do you consider it necessary to bend elbow during pull? Explain.
5. How should one finish the drive? Why?
6. Is the timing of the stroke the same as that used for the side stroke? Explain.

5. DOUBLE OVERARM STROKE OR MODIFIED TRUDGEN

The double overarm stroke may be used as an endurance stroke.

It is a modification and outgrowth of the single overarm stroke. The main difference is that both arms recover out of the water alternately. This causes the body to roll from the side to the chest, which necessitates a change in the head position while breathing.

(This stroke is analyzed for one swimming on right side.)

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.
(2) Analysis of the coördinated stroke.
    (a) Practice the coördinated stroke in water while being supported by a partner, wings or any other suitable device.
    (b) Swim the coördinated stroke.
    (c) Refine details of the stroke.

GROUP II. Assuming the student has learned the side or crawl strokes and wishes to master the double overarm stroke proceed as follows:

(1) Carefully study and practice your assignment.
(2) Analysis of the leg movements:
    (a) Grasp the railing, left hand on top, right under (see Fig. 4, page 69).

        Count 1. Pretend that the top arm is recovering forward while you inhale and the body first assumes a semi-side then a prone position, legs extended, heels touching.

Count 2. Pretend that the top arm is starting its pull while you assume a prone position and exhale. After the mid-drive, turn and execute a narrow scissors kick, from fourteen to twenty-four inches. Finish with a forceful exhalation above the water.

(3) Analysis of the arm movements:

(a) Analysis of each arm movement. (Refer to page 100, Crawl Stroke.)

(b) Analysis of the complete arm movements (as described for the crawl stroke, page 101). Progress from the single to the trudgen by overreaching with the top arm, turning the body to the prone position, so as to free the under arm, then complete the stroke.

(4) Analysis of the coördinated stroke:

(a) Practice the coördinated stroke while standing about the pool or in the water, so as to obtain the correct timing. Think while executing the movements as follows:

Count 1. Inhale, pull right while you recover over left, rest the legs.

Count 2. Turn the body forward, exhale, while you start pulling left, recovering over right (see Fig. 4, page 79), execute a scissors kick. Finish in a semi-side position exhaling above the water.

(5) Swimming the double overarm stroke:

(a) Start with a push-off and attempt a few double overarm strokes, stressing the correct timing and turning forward so as to free the under arm.

(b) When you are able to swim fairly well, refine details of the stroke and develop your endurance by gradually increasing your distance.

Faults and Their Correction

Holding the breath instead of exhaling under water, or forgetting to forcibly exhale the last bit of air above the water, is fatiguing and likely to cause choking. Correct by first taking a quick inhalation, close the mouth, stress the continuous blowing out under water and the final forceful exhalation above.

Using too wide a leg spread with a marked knee bend offers resistance. Correct by taking a small, relaxed, almost straight-leg recovery.

Remaining in a semi-side position throughout the stroke, instead of alternating from a semi-side to a prone position, prevents correct body position and recovery of the under arm. Correct by emphasizing the turn forward as you start the left-arm pull.

Review Questions

1. What difference is there in the head positions while breathing in the double overarm stroke and side stroke? Why?
2. Is the timing of the leg drive in the trudgen the same as for the single overarm stroke? Explain.
3. Describe the correct arm movements.
4. What is the correct timing of the arm and leg action? Why?

6. TRUDGEN CRAWL

Some individuals find the trudgen crawl more restful than the crawl and especially useful for distance swimming.

The trudgen crawl is a combination of the trudgen and crawl leg movements and may serve as a transition stroke to the crawl. This stroke is a slight variation from the modified trudgen, the only difference is that the scissors kick is intercepted by the up-and-down leg thrash of the crawl kick and there is a slightly decreased body roll. In consequence, the trudgen crawl has the possibility for greater speed than the trudgen, because the crawl kick helps to propel the body forward instead of allowing the legs to drag as in the modified trudgen.

(This stroke is analyzed for one swimming on right side.)

Progressive Steps for Learning or Teaching This Stroke Are:

Assuming that the student has learned the crawl or trudgen and wishes to master the trudgen crawl proceed as follows:

(1) Analysis of the leg movements:

(a) While holding the rail, practice the combination scissors and crawl kick. Reduce the scissors kick to twelve or fourteen inches and, instead of resting the legs during the interval of *Count 1*, substitute with the small crawl-kick leg action. During the interval of *Count 2* employ the scissors kick.

(2) Analysis of the coördinated stroke:

(a) Swim the trudgen crawl according to the following counts:

Count 1. Inhale, pull right arm while you recover over left arm and execute the crawl kick (see Fig. 1, page 95).

Count 2. Exhale while you pull left arm and recover over right arm and use the scissors kick (see Fig. 4, page 79).

Faults and Their Correction

Refer to the double overarm (page 82) and crawl (page 104) strokes for the various faults which are likely to occur.

Review Questions

1. Describe the leg movements of the trudgen crawl.
2. Is the body position for the trudgen crawl the same as in the modified trudgen?

7. PRELIMINARY CRAWL

Once the novice feels at home in the water, has learned to control his breath, breathe, float on his face and back and regain standing position, he is ready for his first swimming stroke, with his body in a prone position.

The preliminary crawl is the beginner's foundation stroke for learning the crawl. Because of the gradual progression and simplicity of the stroke, the novice usually masters the fundamental steps in a few lessons. However, the majority requires considerable practice to effectively combine the breathing with the coördinated stroke and swim it in good form.

(This stroke is analyzed for one swimming on right side.)

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.

(2) Analysis of the coördinated stroke, land practice.

  (a) Lie on a bench or spring-board, practice the combined arm and leg movements (or substitute (a) of the next step).

(3) Application of the coördinated stroke, in the water.

  (a) Practice the coördinated stroke while being supported by a partner, wings or any other suitable device.

  (b) Swim the coördinated stroke.

  (c) Refine details of the stroke.

GROUP II. Those individuals who prefer learning this stroke by mastering each part separately then combining them will proceed as follows:

(1) Carefully study your assignment and be prepared for a class discussion of the theory and means of obtaining the best results.

(2) Review breath control, breathing, face-submerged floating and regaining standing position as given in Chapter I.

(3) The face-submerged push-off and regaining standing position.

(4) Analysis of the leg movements, land practice:
  (a) At home or about the pool in a prone position (or substitute (a) and (b) of next step).

(5) Application of the leg movements in the water:
  (a) Holding on to the railing.
  (b) Face-submerged push-off, crawl kick.

(6) Analysis of the arm movements, land practice:
  (a) Analysis of each arm movement.
  (b) Analysis of the complete arm movements (or substitute (a) of next step).

(7) Application of the arm movements, in the water:
  (a) Standing in shallow water, analysis of each arm movement, then both.

(8) Analysis of the coördinated stroke, in the water.
  (a) Practice the combined arm and leg movements with the mouth raised sufficiently to clear the water.
  (b) Practice rhythmic breathing with the head in correct position, while holding the railing, and using the crawl kick.
  (c) Standing in shallow water, execute the arm movements while practicing rhythmic breathing, correct head position and stress proper timing of the head with the arms.
  (d) Swim the coördinated stroke, accentuating the body turn, correct timing of the head with the arms and attempt to get the mouth free of the water surface for the inhalation.
  (e) When the preceding step is mastered attempt to swim the coördinated stroke, trying to breathe during each stroke.

Land Practice

Practice this stroke at home or about the pool. Assume a prone position when executing the crawl kick. It is helpful to practice the arm movements before a mirror so as to study each part of the stroke (see Figs. 1 to 4, page 91).

Water Practice

Face-Submerged Push-Off

The momentum gained from the push-off is sufficient to keep the body afloat, and it is the initial step for propelling one's self and learning to balance the body in this position.

Starting Position: Stand with the back to the side of the pool or any support, submerge the shoulders. Extend the arms in front of the body, thumbs locked (or hands parted), and rest them on the water surface. Incline the body forward, at the same time keep the hips as close to the support as possible, then place one foot against the side of the pool (see Fig. 1, page 89).

Push-Off: Take a deep inhalation and submerge the face. Then quickly and forcibly push the body away from the side of the pool by straightening the flexed leg. Finish with the legs extended and together (see Fig. 2, page 89).

If executed correctly the body will glide forward in the face-submerged floating position as far as the momentum of the push-off will permit and as long as one is able to hold the breath.

Regain standing position.

Breathing

Practice rhythmic breathing while holding on to the railing or standing in shallow water. Start with the right cheek in the water, mouth raised sufficiently to clear it, then *look* to the side. Take a quick inhalation through the mouth, while you pretend that the top arm is recovering forward (see Fig. 1, page 7). Turn the head forward, close the mouth, exhale through the nose (or hold the breath), and *look* straight ahead, while you pretend that the top arm is pulling (see Fig. 2, page 7). Return to starting position, *forcibly exhale the last bit of air above the water before attempting the next inhalation.* This enables one to breathe easily while swimming.

Leg-Movement Analysis

Starting Position: Grasp the railing with the left hand and place the right hand about twenty inches below, fingers pointing down, thus supporting the body while in the prone position. Free the mouth from the water surface.

Face-Submerged Push-Off and Glide: Fig. 1. Starting position, face-submerged push-off. Fig. 2. The glide. Fig. 3. Practicing crawl kick.

Start with the relaxed legs extended, close together, then toe inward.

Counts 1 and 2. The alternating up-and-down crawl kick.

Practice the crawl kick, which consists of a series of quick scissoring movements, or leg thrashes, of even length. The leg drive extends from the hips to the pointed toes, and is executed with just enough bend in the knees and ankles to permit relaxation. The drive varies from six to twelve inches, with the feet submerged or only the heels breaking the surface. At first perform the leg movements slowly, gradually increasing the speed until an easy rhythm is established (see Figs. 1 to 4, page 91).

The propelling power of the crawl kick is derived from the fast scissoring leg action: as the legs close, the water is forced out, thus sending the body forward. Toeing in helps to relax the ankles and gives added power.

Arm-Movement Analysis

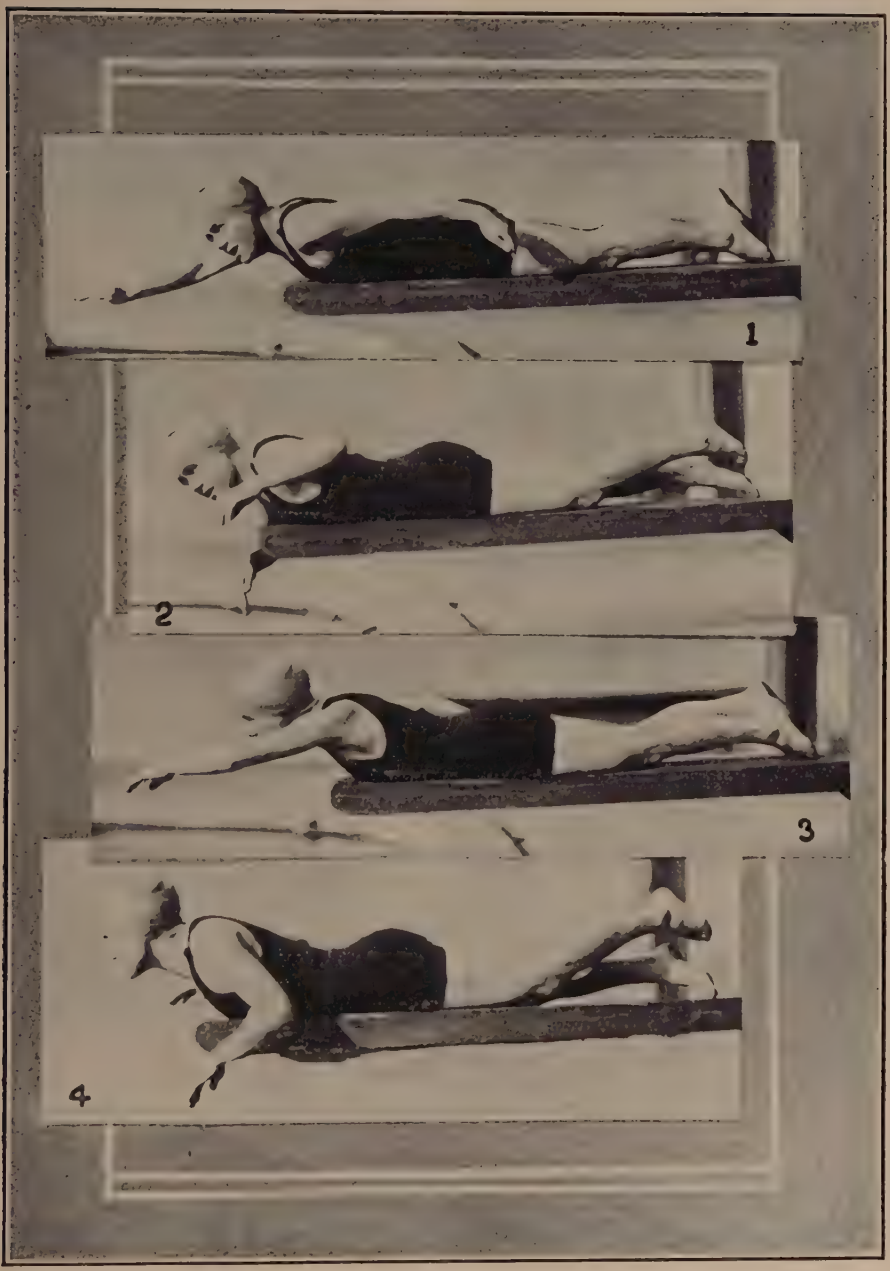
First Step (Left (or top) arm analysis):

Starting Position: Stand in shallow water, submerge the shoulders, lean forward slightly. Rest the extended right arm on the water surface, with the hand pointed toward the body's center line. Extend the relaxed left arm to the rear, near the body, palm down, resting on the water surface (see Fig. 1, page 93).

Elbow Bend: Quickly bend the elbow *without moving it forward,* and finish with the fingers pointing forward. This reduces muscular effort and helps to relax the arms. Raise the arm just enough to clear the water surface (see Fig. 2, page 93).

Slowly Extend: Slowly straighten the relaxed arm forward, just above the water surface, finish with the elbow slightly elevated, hand in front of the face. You should feel the greatest relaxation at this time (see Fig. 3, page 93).

Pull: Pull down in front of the body with the hand following the imaginary center line. The first fourth of the pull is taken with the arm extended, then finish the drive with the arm bent, elbow leading (see Fig. 4, page 93). At the end of the pull, turn the palm in so that the little finger is uppermost and the hand *cuts* the water (see right hand, Fig. 3, page 93).



Preliminary Crawl: Fig. 1. Inhalation; start of left (or top) arm recovery; correct catch position, or start of right-arm drive, crawl kick. Fig. 2. Left arm in mid-recovery, right arm in mid-drive, crawl kick. Fig. 3. Exhalation; left arm starting drive, right arm finishing, body turned forward, crawl kick. Fig. 4. Left arm in mid-drive, right arm in mid-recovery, crawl kick.

Start the recovery with the hand held in this natural position (see Fig. 1, page 103), or with the palm down (see Fig. 1, page 93).

Practice the right-arm recovery and drive in the same manner.

SECOND STEP (Complete arm-movement analysis):

After you have learned the movements of each arm, assume the starting position as described and practice the complete arm movements while thinking:

Count 1. Pull right arm while you quickly bend, then slowly straighten forward left arm.

Count 2. Pull left arm while you quickly bend, then slowly straighten forward right arm.

When first attempting the complete arm movement take it very slowly. Stop for a moment at the start, mid-position, and finish of the stroke, so as to intelligently direct and verify the results. Then continue the arm movement slowly without stopping, feeling the utmost relaxation during the recovery (see Figs. 1 to 4, page 93; Figs. 3 and 4, page 95).

Coördinated Stroke Analysis

FIRST STEP (Combined arm and leg movement analysis, with head raised, chin at the surface):

Starting Position: Grasp the railing with the left hand, rest the right arm on the water, place the feet against the side of the pool, push off.

Coördinated Stroke: It is most important to commence with a vigorous leg drive and maintain it so as to give the body sufficient momentum to assume the horizontal position. This will automatically establish the timing between the arms and legs. Then move the arms slowly while you think, *"Pull, force the elbow back and cut right, bend* and *slowly straighten forward left,* then the reverse of this." You should work for a slow, relaxed and correct arm movement instead of for speed, for speed and power are dependent upon correct form. At the same time raise the mouth sufficiently to clear the water surface and breathe naturally.

Many rest the right cheek in the water during the inhalation, as that is their natural breathing side. While rolling from side to side determine your breathing side by your natural

Preliminary Crawl (Continued):—Practicing Arm Movements. Fig. 1. Inhalation; right arm starting drive, left arm finishing recovery. Fig. 2. Right and left arms nearing mid-drive and recovery. Fig. 3. Exhalation; body turned forward, right arm nearing finish of its pull as left arm starts drive. Fig. 4. Right and left arms nearing mid-recovery and drive.

inclination, by the side which has the greatest roll and raising of one hip, by widest spread or opening during leg action.

Second Step (Arm-movement analysis, while stressing correct breathing and timing):

Starting Position: Stand in shallow water, submerge the shoulders, start with the right arm forward, the left back. Rest the right cheek in the water and *look* to the side (see Fig. 1, page 93).

Timing the Breathing and Head Turn With the Arm Movements: While remaining in a semi-side position, inhale, *look* to the side until the left (or top) arm starts its pull. Turn forward, exhale and *look* forward until the right (or under) arm starts its pull. Then return to the starting position, *exhaling the remaining air above the water* (see Figs. 1 to 4, page 93).

This timing of the head with the arms enables one to breathe correctly, aids in the under arm recovery, and establishes a better balance. The arms work independently of the body. If you overreach, the shoulder follows the arm, which eliminates its proper support and causes the body to tip to that side.

In order to get the feeling of swimming while timing the breathing with the top arm practice the following exercise: Grasp the railing with the right hand, start with crawl kick while you time the breathing with the top arm as described. Remember, do not look forward or turn forward until the top arm starts its pull.

Practice the second step according to the following counts:

Count 1. Inhale while you pull right arm, recover over left arm, crawl kick.

Count 2. Turn forward, exhale while you pull left arm, recover over right arm, crawl kick (see Figs. 1 and 2, page 95).

Swim slowly and relaxed and think through the correct timing. You should not be discouraged when first attempting to combine the breathing with the coördinated stroke, as this is the most difficult step. Constant repetition and patience are essential.

Faults and Their Correction

Noticeably bending the knees so that the feet are raised high out of the water results in wasted energy and lost power. Correct by first

Preliminary Crawl (Continued): Fig. 1. Coordinating breathing with preliminary crawl, inhaling as left (or top) arm recovers. Fig. 2. Turning body forward, exhaling as left (or top) arm pulls. Fig. 3. Class practicing crawl, left (or top) arm in recovery. Fig. 4. Left (or top) arm in catch position for its drive.

practicing the kick with the legs straight, then have just enough bend for relaxation.

Drawing the knees up under the body is a false idea of the crawl kick and greatly retards progress. Correct by feeling the body and legs extended.

Executing a very wide leg thrash is tiring and increases resistance. Correct by narrowing the thrash and feel that the kick comes mainly from the feet.

Attempting to perform the crawl kick in a fast, jerky or rigid manner and spreading the feet only two or three inches results in tension and decreases driving power. Correct by temporarily taking a wide, relaxed drive, extending from the hips to the pointed toes, making sure that the feet are at least ten inches apart.

Starting the recovery with the arm held rigid, palm up, results in arm and shoulder tension and increased resistance. Correct by starting the recovery with the palm down or hand in a natural position, relaxed arm near the water surface.

Using a high, straight-arm recovery is a needless expenditure of energy, it increases the body roll and makes it difficult to breathe. Correct by starting the recovery with the elbow bent and close to the surface.

Recovering with the arm submerged or elbow dragging and hand high increases resistance and body roll. Correct by slightly elevating the elbow, lowering the relaxed hand and recovering with the arm raised sufficiently to clear the water.

Forcibly extending the arm during the final part of the recovery prevents relaxation and rest, of which one should take advantage. Correct by feeling a slow, relaxed extension.

Crossing over in front of the face or around the head at the catch limits the drive. Correct by slowly straightening the arm forward, finishing with the hand slightly to the outside of the body's center line.

Finishing the recovery with the arm wide of the center line decreases the driving power and support. Correct by starting the drive on the imaginary center line.

Overreaching during the recovery causes the shoulder to drop, because power was not applied first, thus supporting it.

Keeping the arm extended during the entire pull, whether it be in front of the body or to the side, increases the body roll and is lost power. Correct by taking the first part of the pull with a straight arm, then execute a forearm drive with the elbow bent and leading, and as the hand nears the hip, swing the forearm to the surface, hand cutting the water.

Finishing the recovery by forcibly swinging the hand out of the water, with the palm up disturbs balance, is a waste of energy, and retards the swimmer. Correct by cutting the water during the latter part of the

recovery and finishing with the relaxed hand palm down, resting on the water.

Attempting to swim the coördinated stroke by bending at the waist, twisting the body or arching the back too far, interferes with the proper body balance. Correct by feeling the body relaxed and extended.

Attempting the coördinated stroke by either forgetting to kick or using an incorrect leg action increases the body drag and interferes with the proper timing. Correct by starting with a vigorous leg action and concentrate your attention upon it while slowly moving the arms.

Failure to exhale when the face is submerged, *to complete the expiration when the face is raised* or to breathe during every complete stroke, is likely to cause choking and greater fatigue, due to the accumulation of carbon dioxide. Correct by taking a quick inhalation and exhaling part of the air under water (or hold the breath) and the rest at the water surface.

Unnecessary raising and lowering of the head while breathing disturbs the body balance. Correct by just turning the head to the side, with the top of the head down for the inhalation, and then look straight ahead, eyes at the surface, during the exhalation.

Failure to time the breathing with the arms usually does not allow time enough for breathing, augments a double body roll, makes the stroke uneven and prevents a correct underarm recovery.

Review Questions

1. Of what importance is the preliminary crawl? Why?
2. How do you obtain the maximum of drive for the kick?
3. Explain the technique of the arm movements during the recovery, catch, pull and finish of the stroke.
4. Justify this technique by giving the theory supporting it.
5. Do you consider it essential to breathe during every stroke? Why?
6. Is it necessary to lift the head out of the water during the inhalation? Why?
7. Should the breathing be timed with the arm movements? Why?
8. Is it necessary to time the arm and leg movements when swimming the coördinated stroke? Why?
9. If you choked or became fatigued while swimming the preliminary crawl in deep water, what would you do? Why?

8. CRAWL

The crawl is universally recognized as the supreme speed and endurance stroke. The velocity which one is able to maintain throughout this stroke is due to the following factors: Correct body balance, with the maximum power properly applied during the drive, thus enabling one to take advantage of the hydroplaning principle; minimizing resistance during the negative movements of the stroke and obtaining complete relaxation during the recovery; and the synchronizing of all movement combined with rhythmic breathing.

When one is able to swim the crawl in good form he can fully exploit his powers and obtain the utmost relaxation during the recovery movements. This makes it possible to effectively adapt this stroke for distance swimming and for life saving.

(This stroke is analyzed for one swimming on right side.)

Progressive Steps for Learning or Teaching This Stroke Are:

(1) A complete review of the preliminary crawl is necessary, and demonstrate your ability to swim the coördinated stroke, combined with breathing, for at least twenty-five yards.

(2) Correct and refine the leg movements.

(3) Correct and refine the arm movements.

(4) Properly time the breathing with the arm action.

(5) Correct the shoulder position and body balance.

(6) Correct the coördinated stroke.

Water Practice

Crawl Kick Analysis

In order to correct the important details of the leg action, practice it while holding the rail, or while swimming (see Fig. 3, page 89).

The thrash extends from the hips to the pointed toes. The propelling power is obtained by forcing out the water between

the legs as they come together. The width of the thrash varies from eight to twelve inches. It is determined by the build of the individual, and his length of legs. The number of beats or leg drives to each complete arm movement depends on the type of crawl used; that is, whether it is a six-, eight-, ten- or twelve-beat leg action. The width of the crawl kick varies with the distance negotiated. A sprint requiring a narrow, rapid action, while distance necessitates a slower, wider range.

The alternate up-and-down action is executed with the legs and ankles extended, though relaxed, while the feet are held in the natural or pigeon-toed position. There is a slight knee-and-ankle action which affords relaxation. As the feet move up and down, *toeing in,* they pass each other weaving in and out in a wavelike fashion, thus giving added relaxation and power.

If you have ever visited an aquarium, you could not help but be impressed by the graceful, undulating movements of the tails of the fish, which help to propel their bodies. This wavelike action is somewhat similar to that used in the perfected crawl kick. The natives of the Hawaiian, Samoan and other South Sea islands, although untutored, illustrate this comparison beautifully. The straight up-and-down leg movement was used extensively until Duke Kahanamoku proved the superiority of the relaxed pigeon-toed style of leg action. In a swimming meet held at Yosemite "the Duke" demonstrated the unusual power of his leg drive by propelling himself upstream, using his legs alone. He was able to keep abreast other good swimmers who were using the crawl, arms and legs combined.

When swimming the crawl the feet should remain just below the surface throughout, so as to obtain the maximum power from the drive, which is utilizing the resistive force of the water (see Fig. 4, page 103). In speed swimming, however, the heels or ankles break the surface. The head and body position largely controls the depth of the feet in the water; that is, if one holds the head high, arches the back, assuming a planing position, the feet will remain below the surface.

The majority of swimmers adapt themselves naturally to the six-beat crawl. Some prefer a rapid and narrow eight-, ten- or even twelve-beat thrash. The style of crawl, or the number of leg beats used should be determined by your inclination and ability, directed by expert coaching.

Arm-Movement Analysis

The crawl arm movement is an alternate overarm recovery and drive with the arms working independently of the body. The action is continuous and the arms remain the same distance apart throughout the stroke. While the forward arm starts its downward pull the other arm is just clearing the surface.

First Step (Left (or top) arm analysis):

Recovery: Start the recovery with the arm relaxed (see Fig. 1, page 93). Quickly bend the elbow, finishing with the fingers and forearm pointing forward, arm raised sufficiently to clear the water surface (see Fig. 2, page 93). Then slowly extend the relaxed arm forward to its catch position, on the outside of the body's imaginary center line (see Fig. 3, page 93).

Starting the recovery with the arm flexed aids in maintaining the proper balance, reduces muscular effort by dividing it between the shoulder and elbow. A straight-arm recovery places undue strain upon the shoulder muscles, because the weight is not distributed as in the bent-arm position. During the latter part of the recovery the elbow should be slightly elevated above the relaxed wrist and limp hand, so as to prevent dragging the elbow, to support the shoulder and apply the power correctly (see Fig. 3, page 93).

The recovery movements of the crawl may also be made by starting with the hand in the same position in which it cuts the water; that is, back of the hand turned slightly forward (see Figs. 1 and 3, page 103). Then turn the palm down as you gradually bend and swing the arm forward to its catch position (see Fig. 2, page 103). Many adapt themselves more easily to this form provided they get the maximum of relaxation during recovery and have the correct technique. Flipping the wrist at the end of the recovery helps some to get the wanted relaxation, for it automatically clears the hand of the water.

Pull: Start the drive with the arm extended, fingers closed, palm on the water surface, elbows slightly elevated (see Fig. 3, page 93; Fig. 2, page 103). Exert a steady downward pressure with the hand while pulling on its side of the body's imaginary center line. The first fourth of the pull is made with the arm extended (see Fig. 3, page 93), utilizing the maximum shoulder and arm power. Then continue the downward pull with the elbow bent and leading until the hand nears the hip

(see Fig. 4, page 93), at which time the palm is turned in. With a short forearm swing the hand cuts the water (see Fig. 1, page 103), and clears it with the back of the hand turned slightly forward.

The first gentle downward pressure on the water serves to support the shoulders and helps to elevate the body to a planing position (see Fig. 2, page 103). During most of the drive it is necessary to bend the elbow and have it lead, because it is impossible to apply enough power to enable one to speedily pull through the water with a straight-arm drive. And the bent-arm pull helps to eliminate the negative action which occurs at the end of the straight-arm pull.

It is necessary to turn the palm in during the last part of the drive, so that the hand can cut the water, blade fashion, thereby minimizing resistance.

Practice the right arm movements in the same manner.

SECOND STEP (Complete arm-movement analysis):

The arms should be kept equidistant throughout the stroke. While one arm is pulling, exerting a steady, forceful pressure during the drive, the other is obtaining its rest during the recovery. *The forward arm starts its steady downward pressure before the other arm clears the water* (see Fig. 2, page 103). This helps to maintain proper balance, support the shoulders, plane the body and enables one to obtain greater velocity because of the continuous propelling power.

Proper Timing of the Breathing With the Arm Action

The accurate timing of the head with the arms facilitates breathing, reduces the body roll, and makes the stroke even.

Turn the body slightly on the right side, *look* diagonally forward, take a quick inhalation while the top arm recovers (see Figs. 1 and 2, page 93). Hold the head in this position until the top arm *starts* its downward pull (with the left shoulder held back and properly supported). Then turn the body and head forward, eyes above the water surface, exhale through the nose, or hold the breath. Remain in this position until the right hand starts its drive (see Figs. 3 and 4, page 93), then turn the head to the side and force out the last of the air above the water. During respiration, just turn the head from the side to the front without noticeably raising or lowering it.

To acquire sufficient form and skill in swimming the crawl you should reduce the body roll and approximate a planing position. Once you have learned to apply your power properly at the catch, thus supporting the shoulder, you can turn the head forward as the top arm swings to catch position, which is the natural tendency.

Make sure that you have selected your proper breathing side, which is determined by natural inclination and the side which has the greatest roll and the widest major kick.

Correct Shoulder Position and Body Balance

The correct shoulder movement is a potent factor for determining the balance of the body and the proper application of arm power.

When swimming the crawl reduce the body roll and shoulder dropping, keep them as nearly even as possible. During the inhalation the under shoulder is submerged and moves forward slightly see (Figs. 1 and 2, page 93; Fig. 1, page 103), but the top shoulder should not lead at any time (see Fig. 3, page 93; Figs. 2 and 4, page 103). Make sure that the left (or top) shoulder is held back until you apply the initial downward pressure with the left arm. In other words, each shoulder should not follow the arm during its recovery.

The following factors are responsible for the dropping of the shoulder: Shoulder following the arm before full reach was attained and power applied properly; overreaching during the catch; or starting the pull with the elbow low, hand high; taking a deep straight-arm pull; starting the recovery arm forward before the pulling arm reaches catch position or is adequately supporting the body; turning forward before applying power with the top arm, turning back before applying power with the under arm.

The correct head, correct shoulder positions and correct arm technique are the greatest factors for effecting balance.

Coördinated Stroke Analysis

The coördination of the crawl consists of the combination of the arm and leg movements according to *Counts 1* and *2*.

Count 1. Inhale while you pull right arm, recover over left arm, crawl kick.

Crawl in Action: Fig. 1. Left (or top) arm nearing mid-recovery (Eleanor Garatti breaking world's record for fifty-yard dash). Fig. 2. Left (or top) arm in correct catch position for drive, left shoulder well supported and held back, head in correct position for exhalation, body well planed (John Weismüller setting new world's record for one hundred-yard free style). Fig. 3. Head-on view of crawl, showing top arm in mid-recovery. Fig. 4. Side view of crawl, showing correct body position and leg action, shoulders in correct position, top arm starting drive.

Count 2. Exhale while you pull left arm, recover over right arm, crawl kick.

In order to take advantage of the hydroplaning principle, extend the body with the back slightly arched, eyes above the water surface, heels just under the water and minimize the body roll (see Fig. 2, page 103). Exert force only during the positive or propelling movements, and feel the utmost relaxation during the recovery or negative movements.

Execute six-, eight-, ten- or twelve-crawl leg beats to each complete arm movement. This will depend on which style is best suited to your needs.

Speed is dependent upon good form. To acquire this, gradually increase your distance until you are able to swim a half mile with ease. Then concentrate your attention on details of the stroke while swimming and being coached. When a good stroke has been learned, intercept the distance swims with a few sprints. (Refer to page 160, How to Train for Competitive Swimming.)

Faults and Their Correction

(First study carefully the Faults and Their Correction, page 94, Preliminary Crawl.)

Swimming with the feet breaking the surface decreases the driving power. Correct by raising the head, arching the back, thus lowering the legs so that they will remain under, or just have the heels break the surface.

Attempting the crawl kick in a pigeon-toed position but with the knees and ankles held rigid limits the driving power and is tiring. Correct by feeling a relaxed knee-and-ankle action combined with a wave-like churning action of the feet.

Employing an irregular, jerky crawl kick limits the drive. Correct by counting the number of beats during each arm drive, then work for an even rhythm.

Starting the recovery arm forward before the pulling arm starts its drive increases the body roll and dipping of the shoulder. Correct by obtaining adequate support with the forward arm in the proper catch position before taking the other arm from the water.

Turning forward before the top arm starts its pull, *turning back before the under arm starts its pull,* may inhibit breathing, increases body roll, makes the stroke uneven and interferes with underarm recovery.

Starting the recovery with the palm up and keeping the arm extended

throughout results in undue shoulder strain and tension. Correct by turning the palm down, bending the elbow and relaxing the arm.

Pulling with the arm extended throughout, wide of the center line or in a zigzag fashion, decreases the propelling power and disturbs body balance. Correct by obtaining the proper support during the catch, and use a forearm drive for most of the stroke, with the elbow bent and leading.

Letting the shoulder follow the arm on its reach before applying power causes the body to roll to that side. Correct by holding the shoulder back until you have started the initial downward pressure on the water preparatory to the drive. This gives the wanted support to the shoulder.

Turning the head forward and under when the top arm is in mid-recovery position interferes with breathing and causes a double body roll. Correct by keeping the head to the side and the shoulder back until the top arm starts its pull.

Swimming in a fast, jerky manner is a needless waste of energy and reduces the propelling power. Correct by executing the stroke slowly and "thinkingly," concentrating on form and endurance. This will automatically increase your speed.

Review Questions

1. Do you consider it necessary to breathe during every stroke? Why?
2. When inhaling, should one turn the head and body or just turn the head? Why?
3. What is the most effective way of performing the crawl kick? Why?
4. Which arm-recovery movement do you consider the best? Explain.
5. Is it necessary to bend the elbow during the recovery and drive? Why?
6. Do the body and shoulders remain even throughout the stroke? Explain.
7. What is the correct position of the shoulders when swimming the crawl? Why?
8. How can one time the breathing with the arm movement? Explain.
9. Why is it necessary to time the head movements with the arms?
10. What are the chief factors contributing toward correct body balance?
11. Is there a definite timing between the arm and leg movements of the crawl? How is it determined?

9. RACING BACK STROKE

The racing back stroke is the speediest of all back strokes and is used primarily for competitive purposes. Having learned the crawl, the transition to this stroke is a comparatively simple matter. The leg drive is similar, the arms alternate in their pull and the breathing is natural.

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.
(2) Analysis of the coördinated stroke, land practice.
    (a) Lie on a bench or spring-board, practice the combined arm and leg movements (or substitute (a) of the next step).
(3) Application of the coördinated stroke, in the water.
    (a) Practice the coördinated stroke while being supported by a partner, wings or any other suitable device.
    (b) Swim the coördinated stroke.
    (c) Refine details of the stroke.

GROUP II. Those individuals who prefer learning this stroke by mastering each part separately and then combining them will proceed as follows:

(1) Study your assignment.
(2) Analysis of the leg movements.
    (a) Grasp the railing, assume a back-floating position.
    (b) Concentrate on the leg drive while sculling.
(3) Analysis of the arm movements.
    (a) Practice at home or while standing about the pool.
    (b) If a railing is available, support yourself with the

toes, assume correct body position and practice the arm movements. Or work in couples. Hold your partner's feet while he practices the arm movements, then change places.

(4) Swim the coördinated stroke.

Land Practice

Practice the racing back stroke while standing about the pool or lying on a bench.

Water Practice

Breathing

Breathe naturally or time it with each complete arm movement.

Back Crawl Kick Analysis

If one has acquired a good crawl kick it will be easy to apply that action in a reversed position. The movements of the legs, knees, ankles and feet are almost the same for both strokes. The thrash varies from six to twelve inches, the knee bend is a little more than in the straight crawl and the feet thrash near the surface. (Refer to the crawl, page 98, for a more detailed description of the kick; also, for another variation of the kick, that described for the sculling stroke, page 62.)

The propelling power is derived from the scissoring leg action; or, if the upward leg movement is accentuated, the body is sent head on by forcing the water away from you with the lower part of the leg.

Arm-Movement Analysis

First Step (Left-arm movement analysis):

Starting Position: Start with the arm extended but relaxed, palm turned out, thumb and index finger resting on the thigh.

Recovery: The first part of the recovery is made by bending the elbow, raising it enough to clear the water surface. The hand slowly follows along the outer part of the body until it nears the shoulder, at which time the elbow is straightened and

the arm is quickly flung into its catch position extended, palm out and a little wide of the shoulder.

By starting the recovery slowly, while bending the elbow, one is able to obtain greater relaxation and reduce the strain of the shoulder muscles.

Another variation of the back-stroke recovery is to execute it with the arm held straight throughout, hand slightly cupped, in position for the catch. This has been used most effectively by champions (see Figs. 1 to 4, page 109).

Pull: Start the drive with the palm turned forward and just under the water surface. Then with a steady sweeping drive, bring the arm down to the side of the body, using a somewhat shallow circular movement with the hand slightly cupped. Finish drive with quick forward sculling movement of the hand. This affords the maximum driving power.

Second Step (Complete arm-movement analysis):

After you have learned the movements of each arm, assume the starting position as described and practice the complete arm movements (see Figs. 1 to 4, page 109).

While the right arm is forcibly pulling down to the right side, the left arm is recovering back to its finish position, and *vice versa.* Practice the movements according to the following counts:

Count 1. Inhale, pull right arm while you recover back left arm.

Count 2. Exhale, pull left arm while you recover back right arm.

Coördinated Stroke Analysis

When combining the arm and leg movements, the body should assume a planing position; that is, with the head held forward, hips slightly flexed. Start a forceful, rapid leg action, then synchronize the arm and leg movements. One may use a six-, eight- or ten-beat leg drive.

Count 1. Inhale, pull right arm while you recover back left arm, crawl kick.

Count 2. Exhale, pull left arm while you recover back right arm, crawl kick.

Racing Back Stroke: Figs. 1 and 2. Left arm nearing mid-recovery, crawl kick. Fig. 3. Extended left arm in mid-recovery, crawl kick. Fig. 4. Right arm nearing mid-recovery, crawl kick.

Faults and Their Correction

Performing the leg action with the knees and ankles rigid causes fatigue and limits the driving power. Correct by bending the knees slightly, feeling an exaggerated ankle relaxation and widening the drive.

Accentuating the downward movement limits the driving power. Correct by having an even drive or accentuating the upward movement.

Starting the recovery with the hand in front of the body, elbow dragging, offers unnecessary resistance. Correct by starting with the palm out, employ a straight-arm recovery.

Finishing the recovery with the hand either crossing over the head or approximating a side-horizontal position results in a poor application of power. Correct by starting the catch with the hand just outside the shoulder line.

Employing a deep arm pull with the palm up increases the body roll and retards progress.

Swimming with the body straight, rigid and head held too far back increases resistance, is tiring and causes water to splash over the face. Correct by slightly flexing the hips, raising the head and looking toward the feet.

Review Questions

1. Is it necessary to time the breathing in this stroke? Why?
2. How does the racing back stroke leg drive differ from the crawl? Explain.
3. What is the most effective way to perform the arm movements of this stroke? Why?
4. Describe the correct body position when swimming this stroke.
5. How does it differ from the crawl? Why?
6. Is there less body roll in swimming the racing back stroke than in the crawl? Why?

10. BREAST STROKE

The logical place for the breast stroke is at the end of the series, as it is not a foundation stroke and is not related to any of the preceding strokes. The modified racing breast stroke is used for competitive purposes. Still another modified breast stroke with a scissors kick substituted for the frog kick is used most effectively for life-saving purposes and as a rest stroke. The breast stroke as taught on the Continent employs a frog kick which can also be used for the latter purpose.

Progressive Steps for Learning or Teaching This Stroke Are:

GROUP I. Those individuals who prefer learning this stroke by first attempting the whole or coördinated stroke and then refining each part proceed as follows:

(1) Study your assignment.
(2) Analysis of the coördinated stroke, land practice.
    (a) Lie on a bench or spring-board, practice the combined arm and leg movements (or substitute (a) of the next step).
(3) Application of the coördinated stroke, in the water.
    (a) Practice the coördinated stroke while being supported by a partner, wings or any other suitable device.
    (b) Swim the coördinated stroke.
    (c) Refine details of the stroke.

GROUP II. Those individuals who prefer learning this stroke by mastering each part separately and then combining them will proceed as follows:

(1) Study your assignment.
(2) Analysis of the arm movements, land practice.
(3) Application of the arm movements, in the water.
(4) Analysis of the leg movements, land practice.
(5) Application of the leg movements, in the water.
(6) Analysis of the coördinated stroke, land practice.
(7) Application of the coördinated stroke, in the water.

Land Practice

Practice the breast stroke at home or about the pool in a standing or prone position.

Water Practice

Breathing

Inhale through the mouth at the end of *Count 1* (as the arms finish their pull) by raising the head sufficiently to have the mouth clear the water surface. During the inhalation guard against turning the head to the side. Exhale through the nose, face nearly submerged during the remainder of the stroke.

Arm-Movement Analysis

Count 1. Pull.

Start the drive with the arms extended forward, backs of hands turned slightly toward each other. Then swing the arms to the rear, exerting a steady backward and downward pressure. Finish the pull with the arms a little in front of the side-horizontal position and about six inches under the water (see Fig. 2, page 113). This backward and downward pressure helps to propel and plane the body.

Count 2. Bend.

Continue to exert a steady downward pressure on the water while you bend and drop the elbows (see Fig. 3, page 113), finishing with the hands, palms down, near the chest. The hands are brought in toward the chest, with the palms down, so as to continue the support of the body.

Count 3. Extend.

Extend the arms forward to starting position, with the palms down (see Fig. 1, page 113). This minimizes resistance.

Leg-Movement Analysis

Count 1. Hold.

During this count the relaxed legs remain extended, heels and knees almost touching.

Count 2. Bend.

With the heels a few inches apart slightly bend the knees and bow them outward, keeping the legs as nearly parallel to

Breast Stroke: Fig. 1. Starting position of breast stroke, arms and legs extended. Fig. 2. Arms nearing end of their drive, legs extended. Fig. 3. Arms recovering to chest, knees bending.

the water surface as possible so that they will not drag and increase resistance (see Fig. 3, page 113).

Count 3. Force the legs back and snap together.

Then in one continuous, forceful movement, extend the legs to the rear, pushing with the soles of the feet, and snap them together.

Feel the utmost relaxation during the glide.

Coördinated Stroke Analysis

Starting Position: Start from a push-off, body relaxed, legs and arms extended, thumbs touching.

Then combine the arm and leg movements as described and according to the following counts:

Count 1. Inhale while you pull the arms sideward and hold the legs together.

Count 2. Exhale while you bring the hands to the chest and bend the knees outward.

Count 3. Extend the arms forward while you force the legs back and together.

If using this stroke for competitive purposes it is necessary to keep the head straight forward throughout. One is disqualified for turning the head to the side or employing a scissors kick. The finish of the race and turn must be made with both hands touching the wall or take-off.

Faults and Their Correction

Breathing at the wrong time breaks the rhythm of the stroke, makes inhaling difficult.

Turning the head to the side while breathing interferes with the proper balance and disqualifies one in competition.

Taking a deep pull with the palms turned directly outward prevents one planing the body. Correct by turning the backs of the hands slightly toward each other and pressing down as well as back.

Failing to exert a downward pressure during the drive and as the hands are brought to the chest allows the body to drop between them.

Extending the arms forcibly with the palms forward during the recovery checks progress. Correct by placing the palms down, thus cutting the water.

Drawing the knees up under the body during the interval of *Count 2* instead of spreading them sideward greatly impedes progress.

Attempting the drive with the ankles rigid, toes pointed and with

insufficient force decreases the propelling power. Correct by forcibly bringing the legs out and together with the ankles relaxed.

Incorrect timing interferes with balance and power.

Review Questions

1. Do you consider the breast stroke important? Why?
2. Is it necessary to time the breathing with the stroke? Why?
3. What is the correct position of the head while breathing? Why?
4. How can one obtain the best support and maximum propelling power during the arm movements?
5. Do you consider it necessary to spread the legs during the interval of *Count 2?* Explain.
6. Is the leg drive executed in one or two counts?
7. What is the correct timing for the coördinated stroke?

(Refer to page 227 for games or stunts employing the various strokes learned, as form, speed and endurance contests, medleys, tandems, etc.)

CHAPTER V

RACING STARTS, TURNS AND PLUNGE FOR DISTANCE

1. RACING STARTS

Free-Style or Breast-Stroke Start

For competitive purposes it is essential to acquire a correct and speedy start.

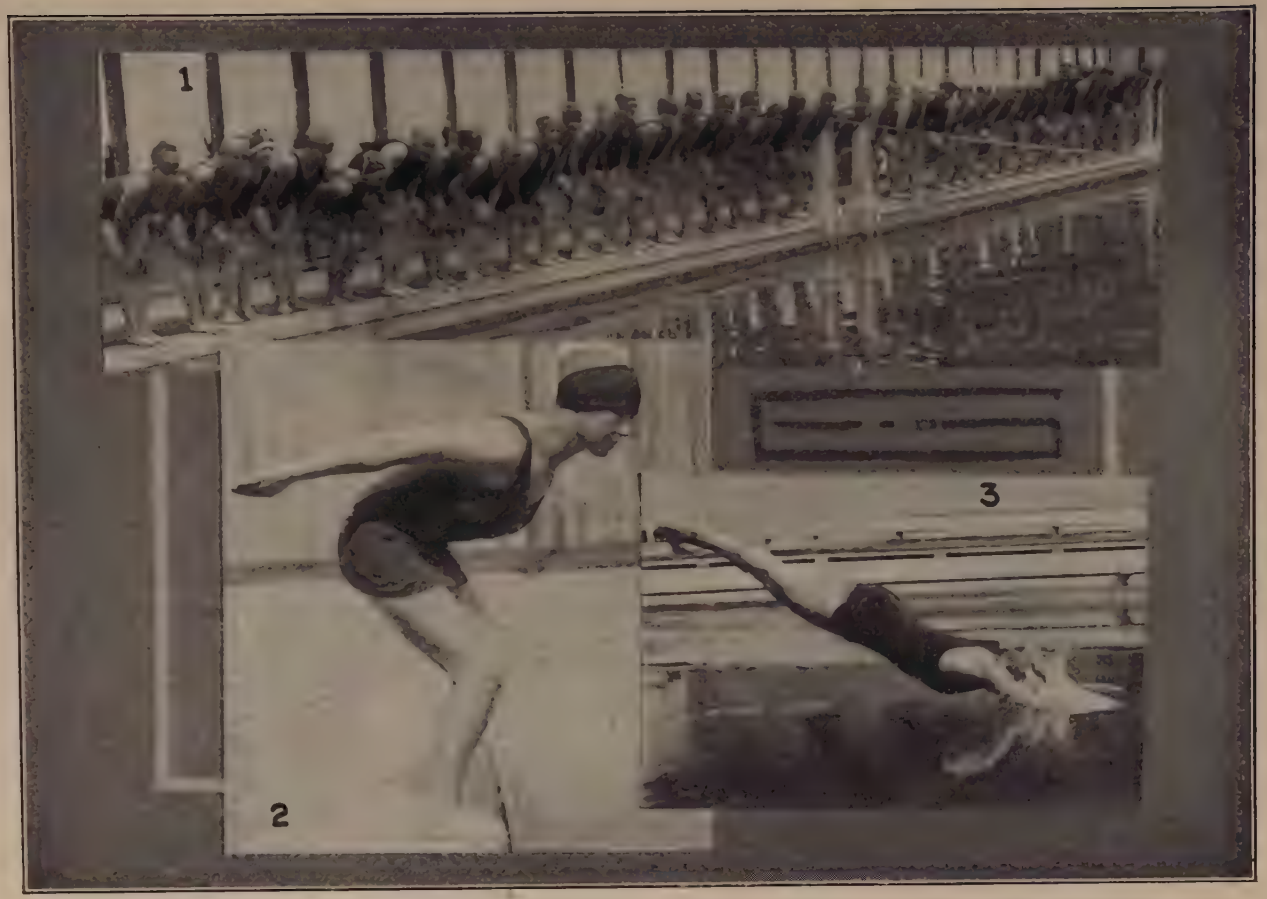
Starting Position: Stand with the feet a few inches apart, toes gripping the edge. Incline the body forward from the waist, slightly bend the knees. Start with the extended arms to the rear, near the body, head up (see Fig. 2, page 117).

Racing Dive: Rise on the toes, quickly swing the arms forward at the same time forcibly straighten the knees and ankles, push away by exerting pressure with the toes (see page 118). Jump out as far as possible (see Fig. 3, page 117). While in the air the body should be extended, head slightly lowered between the outstretched arms, feet slightly raised, and close to the water surface. This will enable you to make a shallow entrance, going just under the water surface or as near it as possible. Assume a planing position, glide, then lose no time in starting your stroke and in getting under way for the race.

The racing dive also may be executed by starting with the hands on the knees or near them (see Fig. 1, page 117). Then rise on the toes, bend and straighten the knees while using a short, quick, circular arm movement; that is, swing the arms up, back, around and forward. Some find that greater speed is attained by slightly arching the body and hitting flat on the surface, while others dive just beneath the surface to get better results.

Faults and Their Correction

Failing to get sufficient spring and force during the arm movements limits the drive. Correct by forcibly extending the legs and pushing with the toes while vigorously swinging the arms forward.



Racing Starts: Figs. 1 and 2. Free-style or breast-stroke racing start. Fig. 3. Entrance position for racing dive.

Starting with the head low or ducking it too quickly causes the body to enter close to the take-off.

Diving too deep (that is, more than two feet under the surface) checks the momentum, since the body takes time to regain the surface.

Failure to have the body extended, head slightly lowered between the outstretched arms during the entry, checks progress.

Failure to properly time the arm swing with the spring results in a slow start.

Starting the stroke before taking advantage of the glide, or waiting until momentum has been expended before beginning to swim, greatly delays the swimmer.

Racing Back-Stroke Start

Face the take-off, place both hands on the rail or edge of the pool, brace the feet against the side and hold this position until the starting signal is given. Vigorously push off, while raising one or both arms over head, glide on the surface or just below it, then start swimming immediately.

Practice raising one then both arms overhead during the start, then choose the method which is best adapted to you. Champions differ in their style, but most favor the double-arm take-off.

The Finish

Close races have been won by a quick finish. Do not slacken your speed but continue the final spurt until you have touched the finish-mark.

The Start: Walter Spence (world's record-holder three hundred-yard medley) shows a perfect take-off.

Free-Style Turn: Fig. 1. Touch. Fig. 2. Starting with left hand pressing against wall, right hand scooping back. Fig. 3. Turn, left hand in position while right hand scoops forward. Fig. 4. Push-off. Fig. 5. Touch. Fig. 6. Push-off.

2. RACING TURNS

Free-Style Turn

The turn is one of the essential factors which may determine the winning or losing of a race. Speed swimming requires the knowledge of a fast turn in either direction.

Land Practice

First practice the movements of the turn while standing about the pool or in shallow water (see Figs. 1 to 4, page 119).

Water Practice

Starting Position: When nearing the side of the pool, adjust your stroke for the turn by taking a few shorter ones or by lengthening it, so that the hand of either flexed arm will touch the wall (see Figs. 1 and 5, page 119).

Touching the Wall: If you touch the wall with the hand of the flexed recovering left arm, place the hand just above the water surface, with the fingers pointing to the right. The right arm is near the side of the body (see Fig. 5, page 119).

Turn: Inhale, turn the body quickly to the right, by pressing hard against the wall with the left hand. Some find it helpful to move the right arm to the rear of the hips with a quick scooping movement, thus forcing the body back against the pool (see Figs. 2 and 3, page 119). Finish with the arms in front of the body, ready for the push-off (see Fig. 4, page 119). Simultaneously draw the knees well up under the body and place the feet against the side of the pool about ten inches under the surface (see Fig. 6, page 119).

Push-Off: Forcibly push away by extending the legs and glide in the face-submerged push-off position. Before the momentum of the glide is checked start a forcible leg thrash, then begin the stroke.

The pressing against the wall and the scooping movement of the under arm, the drawing up of the legs, and the lowering of the head, are made simultaneously.

Practice the turn until all details of the movements have been

mastered. Repeat many times, breaking into action after each attempt. Then practice turning in the water without a support.

Breast-Stroke Turn

This turn is somewhat similar to the free-style turn, only both hands must touch the support at once. Swing or bend the body sharply in the direction of the turn, quickly spin around, then push off.

Racing Back-Stroke Turn

This turn is a little more difficult, because one cannot judge his distance to the approach as easily as in the free-style or breast-stroke turn. You can determine your distance from the wall by turning the head to the side or looking ahead when nearing the wall. Then grasp the railing or place the right (or left) hand on the support. Quickly turn right and swing the left arm over the body, finishing with both hands on the side of the pool, at the same time draw the knees up under you, place the feet against the wall and push off forcibly, with one or both arms raised above the head, glide on the surface or just under it. Practice turning to the right or left.

When first practicing the turn take it slowly and easily. Turn your head and judge your distance so that you will not collide with the wall.

Faults and Their Correction

Lifting the body high while making the turn and pausing for a breath slows down the turn. Correct by inhaling as you approach the wall and quickly perform the turn close to the surface.

Attempting the turn with the arm extended or the body too far away slows down the turn and decreases the glide after the push-off.

Attempting the turn without swinging the head and body in the desired direction causes one to push off sideward or wide of the mark.

Losing speed by gliding to the support instead of swimming is a costly fault.

Failure to push off forcibly and in the correct position results in lost momentum during the glide.

Executing a hurried push-off, usually with just one foot, limits the momentum and throws the body off its course.

Failure to use the correct scooping arm movement causes a faulty turn, since one is too far from the support to get a good push-off.

Executing the back-stroke push-off with the head too far forward or back and the arms in a poor position interferes with the speed of the glide.

3. PLUNGE FOR DISTANCE

The plunge for distance is of no practical value and has survived only because it has been included as one of the official events. Breath control, floating ability and weight are the chief requirements aside from the skill in plunging.

In order to increase your ability to control and hold the breath practice taking a series of rapid inhalations and forced exhalations through the mouth from ten to twenty times. This helps to aërate the lungs, eliminates the carbon dioxide and increases the supply of oxygen.

Starting Position: The correct take-off or dive is the most important factor in determining the success of the plunge. Assume the starting position for a racing dive. Jump up and out (slightly jack the body), obtain greater height but cover less distance than in the racing dive. Enter the water a little closer to the take-off and at an angle of about thirty-five or forty degrees, at a depth of from two to five feet. Extend and slightly arch the body for the entry position, so as to eliminate bending at the waist, thus checking progress.

Plunge: The depth which one should reach depends upon the body buoyancy, weight and build of the individual. After obtaining an underwater glide of from twenty to forty feet, regain the surface by slightly elevating the hands, so as to rise at a slight angle. (Most champion women plungers glide under water for about thirty feet, whereas the men glide from forty to fifty feet.) If the body regains the surface in a horizontal position or at a sharp angle it checks its momentum. The body should be held extended and in a correct diving position during the glide.

If the body tips, exert pressure to the opposite side. If the body goes to the right or left of its course change your direction by bending the body or hands slightly in the opposite direction.

Muscular types experience difficulty in keeping the feet up; to correct this lower the head and arms, arch the back and take a deep breath.

Faults

The following faults reduce the plunging distance:

Diving in without getting sufficient air or clearing the lungs by rapid, forced breathing.

Diving without sufficient force during the take-off.

Entering the water too shallow or too deep.

Entering the water with the body partly jacked.

Coming to the surface too quickly and at a marked angle.

Sinking the feet or spreading the arms and legs.

Review Questions

1. How can one obtain the maximum spring in the racing dive and cover the greatest distance?
2. Is it necessary to approach the wall so that you will turn to the breathing side only?
3. Explain the approach, turn and push-off for the free-style, back-stroke and breast-stroke turns.
4. What factors aid you in obtaining the maximum distance during the plunge?
5. What factors inhibit the maximum glide?
6. If your feet sink, what means would you employ to help elevate them?

CHAPTER VI

DIVING

Diving, while essential as a correct means of entering the water and also of value in life saving, is one of the most graceful and pleasurable of aquatic sports.

1. ELEMENTARY DIVING

Progressive Steps for Learning or Teaching Elementary Diving Are:

GROUP I. Those individuals who possess initiative and courage for diving should start with the plain dive as described in the fifth step.

GROUP II. Those individuals who are timid about diving proceed according to the steps listed under Elementary Diving. It is especially helpful to work with a partner.

First Step—Porpoise Dive

Starting Position: Stand in the water, waist deep, arms front horizontal, palms down, thumbs locked, head down, chin touching the chest, knees slightly flexed.

Dive: Inhale and quickly dive under the water by bending forward, at the same time springing off the bottom of the pool by straightening the flexed knees and pushing with the toes. When the entire body is submerged, quickly come to the surface by pointing the fingers up, raising the head and shoulders and arching the back.

Second Step—Sitting Dive

Starting Position: Sit on the edge of the pool, feet apart, resting on the railing. Bend the body forward, lower the head between the extended arms, until the ears are covered, thumbs locked (see Fig. 1, page 125).

Elementary Diving: Figs. 1 and 2. Sitting dive, starting position and push-off. Figs. 3 and 4. Kneeling dive, starting position and entrance. Figs. 5 and 6. Assisting novice during first step of standing dive and entrance.

Dive: Inhale and spring out by forcibly extending the legs and pressing with the feet (see Fig. 2, page 125). Enter the water to a depth of a few feet under the surface, body extended. Then quickly regain the surface.

IMPORTANT NOTE: When diving, the head and arms largely control the position of the body while in the air during the entry and the recovery. When the body is submerged, quickly come to the surface by pointing the fingers up and raising the head and arms.

Third Step—Kneeling Dive

Starting Position: Place one knee over the edge of the pool and rest the heel of the other foot on the railing (see Fig. 3, page 125). If a railing is not available grip the edge with the toes of the other foot (see Fig. 1, page 131). The arms and head are held in the same position as described in the second step (the sitting dive).

Dive: Inhale, push off with the supporting foot, and regain the surface (see Fig. 4, page 125).

Fourth Step—Standing, Learning the Spring

Starting Position: Stand with the feet apart, the toes of the right (or left) foot over the edge, knee well bent, the left (or right) leg extended to the rear, toes supporting it. Lower the head between the extended arms in a diving position (see Fig. 5, page 125).

Dive: Inhale, enter the water by forcibly extending the left knee and ankle and pushing with the toes, while you noticeably raise the right leg (see Fig. 6, page 125). Enter the water with the body extended and almost perpendicular (from a sixty to seventy-five degree angle).

The tendency of the novice is to fall forward, hitting the water flat. This step is a most helpful means for correcting this costly fault and serves as a preparatory step for obtaining the spring (it may also be practiced on land first, thus giving one the correct feeling of the dive).

Some individuals will succeed in learning the plain dive by first practicing it as illustrated in Figs. 1 to 3, page 127.

Fifth Step—Plain Front Dive

Starting Position: Stand with the body erect, feet together, toes gripping the edge, arms front horizontal, shoulder height,

Elementary Diving (Continued): Fig. 1. Starting position. Fig. 2. Starting the spring by bending knees. Fig. 3. Completing spring, when balance is lost, by straightening knees and pushing with toes.

fingers touching. Or place arms at the sides of the body (see Figs. 1 and 3, page 129).

Dive: Dive in, get the maximum height by using a quick and forceful spring, and simultaneously swinging the arms forward. Finish with the body extended, feet together, toes pointed, straightened arms covering the lowered head, thumbs locked (see Fig. 2, page 129). Enter the water with the body nearly perpendicular (see Fig. 4, page 129).

When first practicing the dive, have the feeling of forcibly pushing from the feet, lowering the head, bending forward and lifting the hips and feet. Some individuals find it more helpful to swing the arms back around and forward in order to obtain the correct lift and entry position.

If your tendency is to go flat, exaggerate the forward head and body bend, or have the feeling that you are trying to stand on your head. If your tendency is to go too deep, do not duck the head until you are about to enter the water.

A correct plain dive is judged according to the start, the height, form in the air and the entrance. The practice and attainment of these requirements prepare the novice for advanced diving.

Faults and Their Correction

Attempting to dive without first taking a deep inhalation or not properly controlling the breath while under water results in choking or exhaustion.

Failure to assume the correct starting position or control the body in mid-air results in a faulty entry.

Falling forward and stiffening the back instead of springing up, then ducking the head and bending forward, results in a flat dive.

Performing the dive with a feeble spring, with the knees and ankles bent, results in lack of body control and just falling into the water. Correct by forcibly extending the knees and ankles combined with an energetic push away with the toes.

Just straightening the knees without getting a corresponding extension in the ankles and a forceful push from the toes results in the body falling forward without a spring. Correct by quickly bending and straightening the knees and ankles and emphasizing the forceful *push away with the toes.*

Ducking the head and bending the body too vigorously, combined with a forceful spring, causes an overthrow of the body. Correct by gradually

Elementary Diving (Continued): Fig. 1. Plain front dive, first position. Fig. 2. Entrance. Fig. 3. Plain front dive, second position. Fig 4. Entrance.

bending the body forward and not ducking the head until you are just about to enter the water.

Performing a deep dive, then attempting to come up by suddenly arching the back before the feet are submerged, strains the back. Correct by waiting until the entire body is submerged before attempting to regain the surface.

Attempting to regain the surface without raising the head and arms upward inhibits one's recovery and may cause one to hit the bottom.

Entering the water without first taking the necessary precautions of locking the thumbs, covering the lowered head with the extended arms, may result in an injury, since the head and face are not protected.

Review Questions

1. Do you consider it necessary for the novice to follow the progressive steps listed before executing a correct plain dive? Explain.
2. What factors control the entry position in diving? Why?
3. How can you obtain the maximum spring and height?
4. What are the four essentials of a correct plain dive?

2. FANCY DIVING

Diving occupies one of the most important places in the swimming program. It offers a strong appeal to both the competitor and spectator.

A casual observer, witnessing a diving exhibition, has been heard to say: "How easily and gracefully each dive is performed!" He marvels at the birdlike descent of the swan dive and the agility of the diver demonstrating his more difficult twists and somersaults. When the spectator observes the finished performance he fails to take into consideration the months of patient practice necessary to obtain this dexterity, poise and grace.

As the diver, step by step, learns each more difficult dive in its turn, he finally reaches his goal, the satisfaction of obtaining skill as an expert fancy diver. Reaching this, the diver develops strong and supple muscles, a grace, a poise and an exceptional accuracy in muscular control, balance and timing of the movements. The mental attributes gained from this endeavor are courage, self-assurance, patience, and the ability to think, analyze and act quickly while diving.

Once you can perform the plain dive in good form, you are ready to progress to fancy diving. However, a knowledge of

Elementary Diving (Continued): Fig. 1. Starting position, kneeling dive. Fig. 2. Starting position, plain dive.

the correct use of the spring-board is needed before any dive can be performed successfully, so it is necessary to go into that subject.

3. LEARNING TO WORK THE SPRING-BOARD CORRECTLY

First Step—Arm Swing and Spring

Individual practice or class drill standing about the pool is invaluable as a means of establishing the correct technique and timing of the movements.

Stand near the water-end of the board, with the head up, body erect, arms relaxed at the sides.

When first learning to work the board execute several continuous springs in place. Start your jump on the end of the board with the arms in a side-horizontal position, alight on the balls of both feet, knees slightly bent. Lower the arms to the sides of the body. Then rebound by extending the toes, ankles and knees, simultaneously combine a forceful, wide, upward arm swing. This complete movement is accurately timed with the board. In order to get the maximum height and proper balance keep the body perpendicular and the head erect.

Practice working the board in this manner, gradually increasing height, while keeping the body nearly erect. Feel the lift from the board. This initial step should be taken without attempting to dive in, for it enables the novice to get the feeling of the board and to time his movements correctly.

Second Step—Analysis of the Step, Take-Off and Plain Dive

Stand several feet from the water-end of the board, body erect, arms relaxed at the sides.

Take one short step and vigorously spring up from the ball of the forward foot, while raising the arms sideward (see Fig. 1, page 133). Descend to the board from the spring with arms lowered while raising one leg slightly forward; this aids in maintaining the perpendicular position (see Fig. 2, page 133). Then rebound from the balls of both feet, rising almost perpendicularly (see Fig. 3, page 133). Get the maximum of height by pressing with the toes and forcibly swinging the arms upward. When you have reached the height of the dive, lower your head between the extended arms, lock the thumbs and bend slightly at the hips in

Working the Spring-Board (Motion pictures of Albert C. White, Olympic Games spring-board and variety high-diving champion and national A. A. U. spring-board (3 feet and 10 feet) indoor champion): Fig. 1. One foot take-off (preparatory jump). Fig. 2. Descending to board from preparatory jump and forceful wide arm swing. Fig. 3. Body in position for rebound from both feet and its perpendicular lift.

preparation for the descent. Enter the water almost perpendicular and close to the board, with the body extended from the finger-tips to the pointed toes. Hold this position until the body is completely submerged. Regain the surface by raising the head and hands or by pushing off from the bottom of the pool.

The *last step should be short and the jump high.* This will enable you to hit the board forcibly and get the maximum of height from the rebound.

Third Step—Running Front Dive

Assuming that you have mastered the preceding steps, you are now ready to execute the running take-off.

First measure your distance by taking three, four or more short running steps (choosing the number which is best suited to you). Then, without attempting to dive, step it off, allowing for a final take-off a few inches from the end of the board. Once you have determined the distance which is best suited to you, practice the running take-off about the pool, stressing the final step and spring correctly timed with the arms.

Now assume a correct standing position at your measured distance, while holding the head and body erect. Take a few steps forward and, with a forceful preparatory jump, leap into the air, rebound on the balls of both feet, obtain the maximum of height, assume a well-poised diving position and enter correctly. (Think: "Step, step, step, jump up and dive!")

The position and weight of the head are the controlling factors in all fancy diving. You must know when you have attained the greatest height to your dive and start the descent; this is a means of timing your diving.

Summary of Essential Factors in Spring-Board Diving

When competing you are judged from the time you step on the board until your feet disappear below the surface.

Starting Position: Step on the board, assume a correct standing position, then walk to your measured take-off. Pause a moment, await the judges' signal, then, with the body well poised, head erect, start the dive.

Take-Off: Approach the board in a confident manner, body well poised. The take-off is made by executing a forceful spring and arm swing, obtaining the maximum of height.

Swan Dive (Diving pictures of Lillian Fergus, junior national diving champion, pages 135 to 147): Upper figure shows position at start of descent of swan dive. Lower figure, correct entrance.

Body Position in the Air: The diver must attain the greatest height possible, control the body perfectly and fulfill the requirements of the particular dive which he is executing.

Entry: The body should be extended, head lowered between the straightened arms, thumbs locked, toes pointed and feet together.

Enter the water at an angle of from sixty to seventy degrees and hold the correct entry position until the entire body is submerged.

The correct entry position for a feet-first dive is with the body extended, toes pointed, arms pressed against the sides, chest up, head back, chin in.

Faults and Their Correction

Failing to assume the position of attention before starting the dive is considered incorrect form.

Running the board with the head and body bent forward instead of holding an erect position, tends to throw the body forward and limits height.

Taking wide, fast steps, instead of short easy ones throws the body forward instead of up.

Failing to get sufficient force and lift during the preparatory jump limits the force and height of the final take-off.

Attempting to work the board by holding the knees stiff and the ankles rigid, landing flat-footed, instead of slightly bending the knees and ankles and then pushing from the toes, limits the spring.

Using an incorrect arm action (that is, too feeble), or swinging arms too far forward or backward (instead of starting with the arms in a side-horizontal position and bringing them down, then forcibly thrusting them upward), limits the lift and may throw the body away from the board.

Attempting the spring while leaning forward, instead of maintaining an erect position, decreases height and throws the body out.

Failing to take advantage of the spring from the board, because of relaxing or bending the knees too much, instead of properly timing the bending and extending with the board, limits height of the dive.

Failing to time your spring with the board, leaving it too soon or too late, limits the height of the dive.

Taking the final jump too far from the end of the board decreases the body's lift from the board.

Failing to maintain the correct body position in the air makes correct height and form impossible.

Failing to hold the body extended in the correct entry position, counts against you.

Front Jack-Knife Dive: Upper figure shows diver at maximum height and in correct tuck position preparatory to descent. Lower figure, correct entrance.

Review Questions

1. What factors contribute toward attaining the maximum height and spring? Why?
2. Why is it essential to keep the body erect and head raised when taking off?
3. Do you consider it incorrect to hit the board flat-footed? Discuss.
4. Why is it essential to use the arms when springing on the board?
5. What difference does it make if you jump near the end of the board or far back from it?
6. Does a fast run preparatory to the take-off give you greater height? Explain.
7. What effect will the length of the step before the preparatory jump have upon the body?
8. What factors control the body position in the air? Why?
9. If you suddenly and vigorously duck the head forward while performing a plain dive, what will happen?
10. What is the correct entry position for a head-first or feet-first dive?
11. What precautions should you take in coming to the surface after an entry?

4. PLAIN AND FANCY SPRING-BOARD DIVING

Swallow (or Swan) or Plain Dive

First Step (Land practice for learning the swan dive):

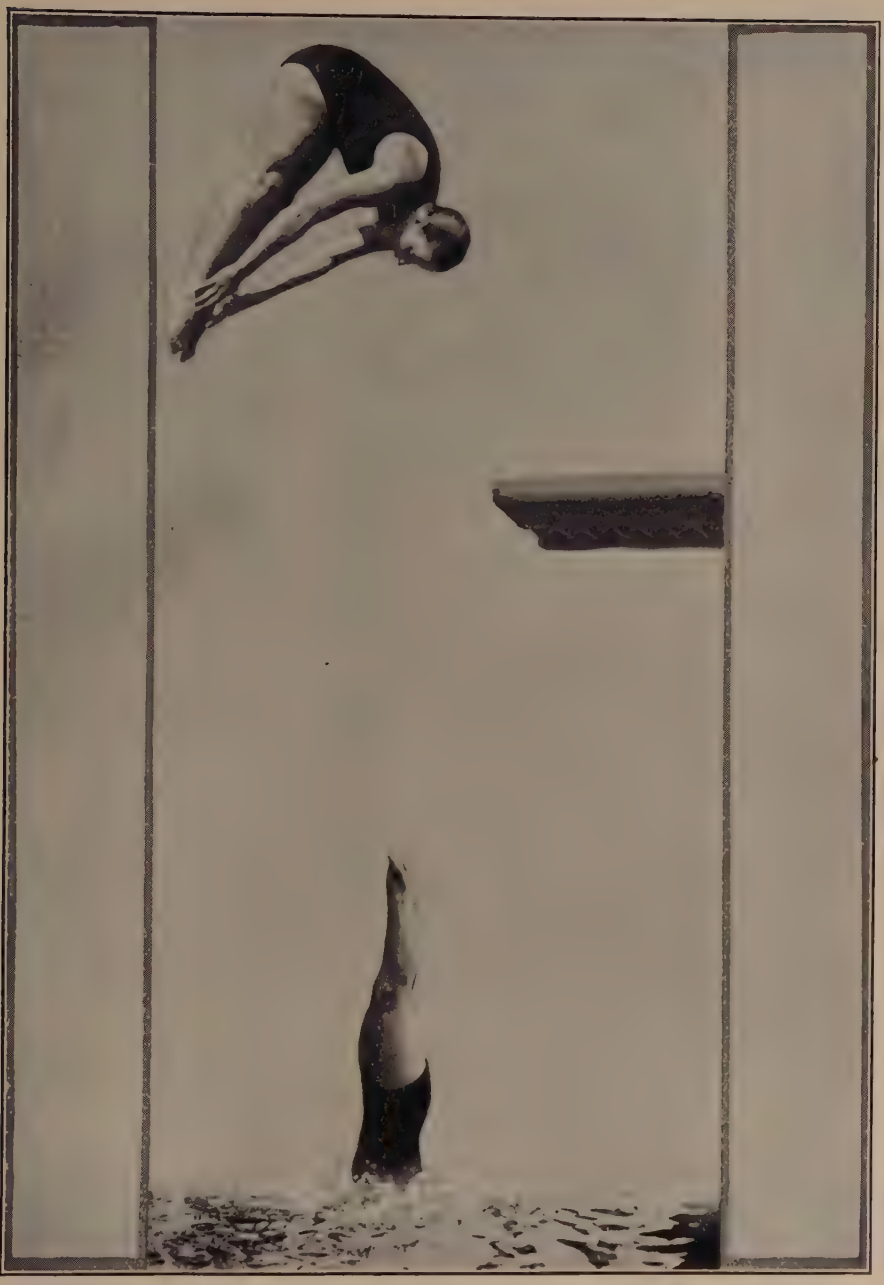
It is essential to practice the following exercises for flexibility and for getting the feeling of arching the back before attempting the swan dive.

Exercise 1. Jump up, quickly arch the back by swinging the arms sideward and backward, bending the head backward and forcing the extended legs to the rear. Resume standing position. Or lie face downward on the floor, then assume a swan dive position.

Exercise 2. While placing the hands on a support of about three feet in height, lift the head and vigorously fling the legs upward, finishing with them extended and the toes pointed.

Second Step (Water application):

In performing the swan dive it is necessary to obtain the maximum height close to the board. As soon as you leave the



Back Jack-Knife Dive: Upper figure shows position at start of descent. Lower figure, correct entrance.

board, start arching the body by swinging the arms sideward, raising the head, completing the back arch by gently lifting the heels and pointing the toes (see upper figure, page 135). When you reach the top of the spring, the head and feet should be at the same height, arms at right angles, and raised slightly above the back, which give the body a correct arch (see Fig. 3, page 157). This arched position is held during the dive. Then enter by lowering the head between the extended arms, locking the thumbs and extending the body (see lower figure, page 135).

If a running plain header is substituted for the swan dive, the diver assumes the position of a plain dive after leaving the board.

FAULTS AND THEIR CORRECTION

Springing out instead of up reduces the height and makes it impossible to execute a good swan dive.

Incorrect position of the arms, too far forward or too far back, either prevents or exaggerates the arch.

Failing to raise the head gives an awkward appearance and decreases the arch position. Attempt dive with head up, hands on hips, to acquire the arch.

Omitting the gentle lift of the legs decreases the arch. Too vigorous lifting of the legs exaggerates the arch and usually causes an overthrow.

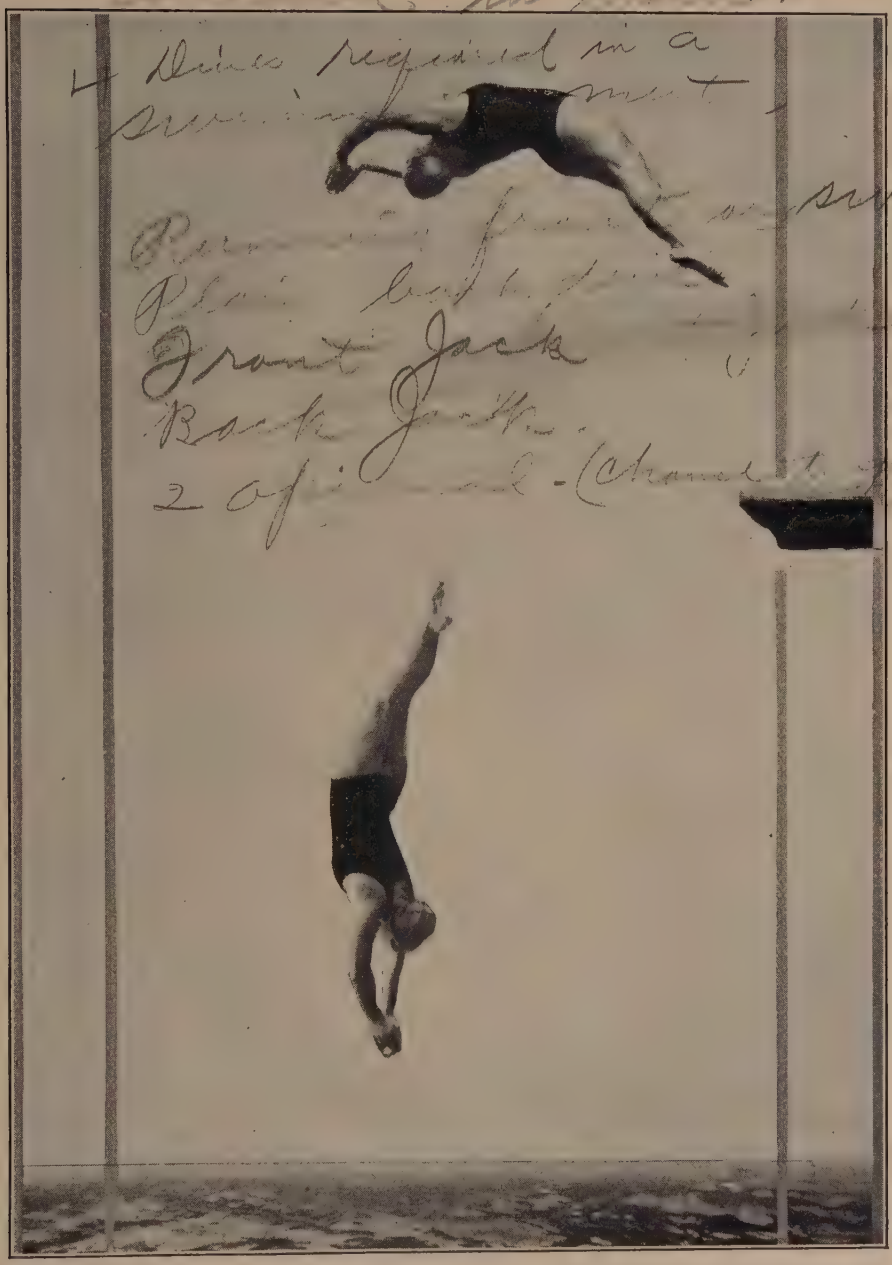
Front Jack-Knife Dive

FIRST STEP (Land practice for learning front jack-knife dive):

In order to get the feeling of the correct jack-knife position and to increase flexibility practice bending forward, touching the ankles or the floor with the hands, while raising the head slightly.

SECOND STEP (Water application):

The front jack-knife dive is executed by forcefully springing up from the board with the body erect. When the body reaches its height, quickly assume a jack-knife position by bending at the waist and lifting the hips. Then touch the pointed toes (or just above the ankles), at the same time attempt to raise the extended legs to meet the hands and slightly raise the head (see upper figure, page 137; Fig. 1, page 153). Hold the jack-knife position for a moment, then assume the correct entry



Back Dive: Upper figure shows diver at maximum height, arching body preparatory to descent. Lower figure, correct entrance.

position by raising the legs, finishing with the body extended. Enter within six feet of the board, but it is better to practice a three-foot entrance (see lower figure, page 137).

FAULTS

Failing to first obtain the maximum height, lift the hips, raise the legs to meet hands, hold the head up, open quickly, and arch the body slightly for entry makes it impossible to execute a correct dive.

Aiming out too far, then attempting to jack, results in faulty form and entry.

Attempting the front jack-knife dive with the head held down tends to overthrow the body.

Failure to extend the legs, to point the toes, bend sufficiently or touch the ankles, is poor form.

Holding the folded position too long does not give time for the correct entry.

Back Jack-Knife Dive

Before attempting the back jack-knife dive it is necessary to practice these preliminary steps to avoid hitting the board and to gradually get the correct feeling of the dive.

FIRST STEP (Learning the backward spring):

Starting Position: Stand with the body erect, heels over the edge of the board, arms front horizontal, shoulder-width apart, then adjust balance.

The Dive: Forcibly swing the arms up, out and down and at the same time spring well up and back, clearing the board at least three feet. Enter the water feet first.

Do not attempt the second step until you are able to jump back at least three feet, so as to avoid a possible collision with the board.

SECOND STEP (Analysis of the back jack-knife dive):

Starting Position: The starting position is the same as described in the first step of this dive.

The Dive: Swing the arms, at the same time quickly and forcibly spring up and back, gaining sufficient momentum to clear the board. Immediately after obtaining the backward spring, lift the hips, bend the body forward at the waist, try to touch the ankles, then quickly straighten the body and enter the water correctly.

Front Jack-Knife With Half Twist: Upper figure shows diver starting half twist. Center figure, turn completed. Lower figure, correct entrance.

THIRD STEP (Back jack-knife dive):

Starting Position: Start this dive by taking one step toward the water-end of the board, then quickly turn the back to the water, place the weight on the balls of the feet, with the heels over the edge. Start with the arms in front-horizontal position, palms down.

The Dive: When balanced, rise on the toes and spring up and out, then quickly jack the body as described in the front jack-knife dive (see upper figure, page 139; Fig. 4, page 151). Hold this position for a second, then, as the body descends, straighten for the correct entry (see lower figure, page 139).

FAULTS

Jumping out (beyond the six-foot line), instead of up, results in a faulty position and entry.

Jumping to the side, instead of back, tends to twist the body.

Bending the knees and failing to point the toes is poor form.

Back Dive

FIRST STEP (Learning the back dive):

Starting Position: Stand with the heels over the edge of the board, body erect, arms front horizontal, shoulder-width apart. Adjust balance, then raise the arms to the vertical position, covering the ears, thumbs locked.

The Dive: Inhale, fall in by bending the head back and arching the body. Hold this position until the body enters the water and is submerged, then come to the surface. It is helpful to have some one holding your hips when first attempting this in order to feel the correct position and avoid going flat.

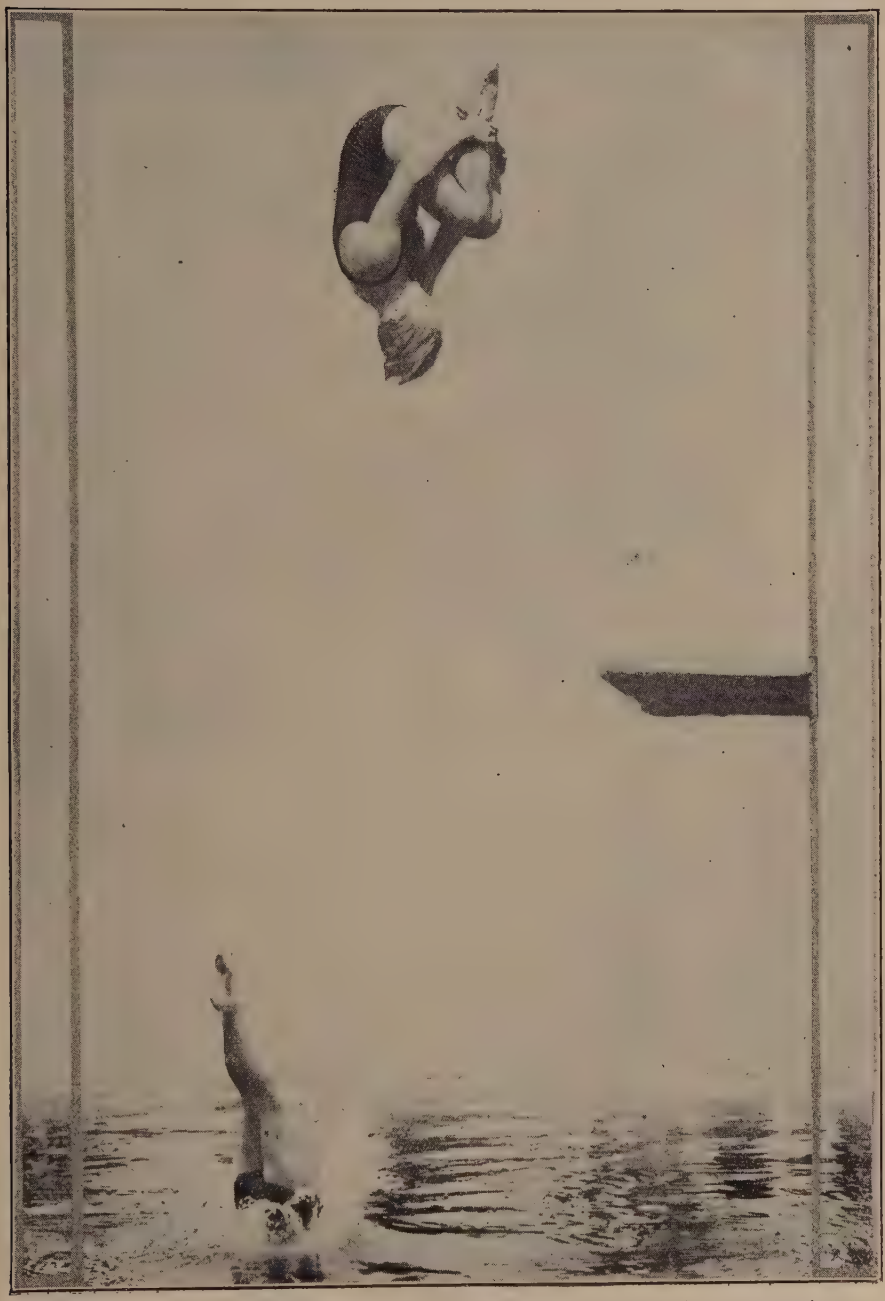
SECOND STEP (Learning the spring):

Starting Position: Start in the same manner as described for the first step.

The Dive: Execute a spring upward, then quickly throw the head back, arch the body and straighten for the correct entry close to the board.

THIRD STEP (Back dive, using the arm swing and spring):

Starting Position: Stand on the firm end of the board, assume a momentary position of attention, then, with the body



Forward One and a Half Somersault: Upper figure shows diver at maximum height, body in tuck position. Lower figure, correct entrance.

erect, walk forward to within six inches of the end of the board, turn sharply, assume the correct back-dive starting position, arms front horizontal, body well poised and balanced on the balls of the feet.

The Dive: Rise on the toes, bend the knees and forcibly swing the arms down and out. Then quickly and forcibly straighten the knees and swing the arms up in front of the body to a vertical position. Quickly execute the arm swing and spring as one continuous movement. After gaining the maximum height from the spring, quickly bend the head backward, arch the body, and swing the arms backward (see page 141; Fig. 6, page 155). Enter the water correctly.

FOURTH STEP (Back dive):

Starting Position: The starting position is the same as described in the preceding step, except that the hands are placed on the hips.

The Dive: Quickly spring up by bending and straightening the knees. Hold the body erect (or slightly forward, if your tendency is to go out too far), and when you reach the greatest height (see upper figure, page 141), quickly bend the head backward, arch the back and raise the arms over the head to facilitate the backward arch. Straighten the body for the entry (see lower figure, page 141).

FAULTS

Starting the back dive in correct position but suddenly bending the head forward and relaxing the hips results in a flat dive.

Springing out instead of up, by throwing the head back too soon, arching the back too suddenly or swinging the arms backward before height is obtained are costly faults.

Getting the maximum height but failing to throw the head and arms back and arch the back quickly enough results in a flat dive.

Noticeably bending the knees or ankles is poor form.

Forward Dive With a Half Twist (the Dolphin or Corkscrew)

FIRST STEP (Land practice):

To prepare yourself for the twists, practice the movements on land. Stand with the arms in a vertical position, depress the left (or right) shoulder, turn the head sharply to the left, look

Half Gainer: Upper figure shows correct position at start of descent of half gainer. Center figure body in position for entrance. Lower figure, correct entrance.

back over the shoulder toward the feet. At the same time pivot around, face in the opposite direction, body arched as for a back dive.

SECOND STEP (Water application):

Perform a plain dive or swan in good form, then, just before the body reaches its height, twist the head and depress the shoulder in the direction you desire to turn while attempting to look over the shoulder, usually the left. The rest of the body gracefully sways in the direction of the turn. Enter with the back to the board and close to it (see Fig. 4, page 153).

Forward Jack-Knife With Half (or Full) Twist

The first part of this dive is performed in the same manner as the front jack-knife dive. After completing it, quickly turn the head and shoulders to the left (or right), simultaneously swinging the right arm forcefully across the body. After the twist, enter as in a back dive (see Figs. 1 and 2, page 153; see page 143).

In order to learn the full twist, perform it more vigorously and rapidly.

Back Jack, Half Twist

In order to perform this dive reverse the movements of the front jack, half twist.

Back Dive With Half (or Full) Twist

Start with the arms in the horizontal position. Jump up, as in a back dive, then quickly bend and turn the body to the left (or right), entering as in a front dive.

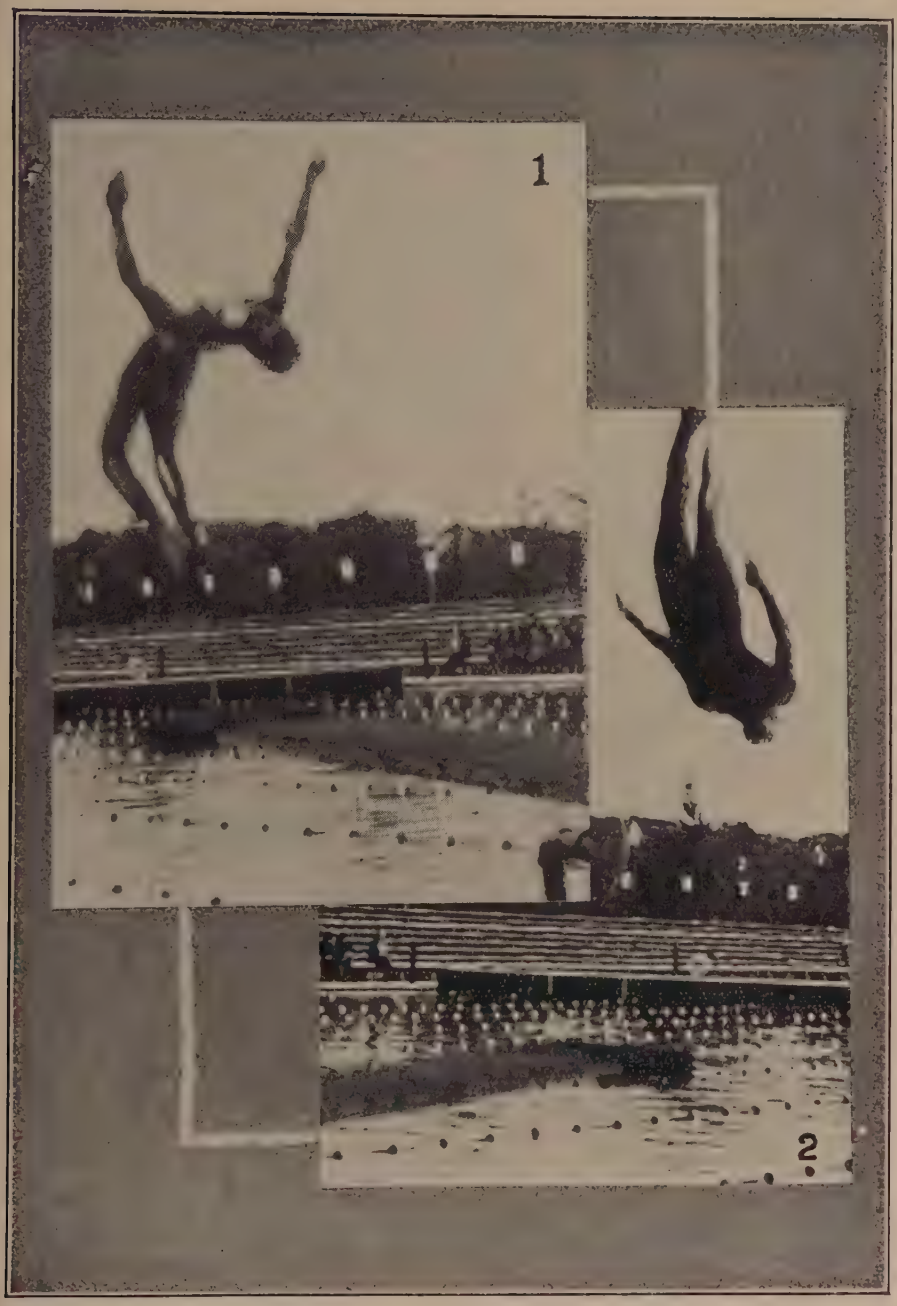
To accomplish the full twist, start the turn sooner and execute it more vigorously. Finish in a back-dive position, and hold the body arched throughout.

FAULTS

Starting the twists before leaving the board, or too late, results in poor form and entrance.

Attempting the turn by twisting at the waistline or kicking the feet, makes it impossible to get around and perform the dive correctly.

Not completing the twist, entering a side position, instead of making a half or full turn, scores against you in a contest.



Full Gainer (Albert C. White performing full gainer in lay-out position): Fig. 1. Starting the full turn. Fig. 2. Body in position, head raised for completing the turn.

Backward Somersault

Starting Position: Start the same as you would for the back dive, arms front horizontal.

First Step (Learning the backward somersault):

Start the backward somersault by first jumping up while lowering the arms a trifle, then swinging them vigorously over the head. Simultaneously throw the head and arms back, draw the knees up to the chest, grip them in a *tuck* position (this facilitates the quick turn when first learning the dive), straighten or slightly arch the body, enter with the arms at the sides.

Second Step (Backward somersault in a jack-knife position):

Once you have mastered the turn and perpendicular entrance, then perform the somersault with a pike or in a jack-knife position. Execute it from a high board in a full lay-out position; that is, the body extended, arms held sideward.

Start with the hands at the sides, when at the top of the spring quickly throw the head and shoulders back and swing the arms to the side-horizontal position. Have the feeling that the body is rotating about the arms, with the hips slightly flexed, legs and toes extended. Enter the water, body erect and slightly arched, arms pressed to the sides.

Backward One and a Half Somersault

First Step (Learning the backward one and a half somersault):

When first learning this dive hold the *tuck* position until entering the water. If you are able to get height and a fast turn, attempt to straighten out quickly by arching the body. The correct timing for the opening can be determined only through practice and is the most difficult part of the dive.

Second Step (Learning to enter correctly):

The principle of this dive is the same as the backward somersault, except that one spins more rapidly and vigorously while holding the ankles during the tuck. Feel the knees pressed against the chest. After the turns have been completed, straighten the body and enter head first as in a back dive. Then

Fancy Diving: Fig. 1. Somersault. Fig. 2. Back header. Fig. 3. Hand-stand dive. Fig. 4. Back jack-knife dive. Fig. 5. Front header.

attempt this dive in a jack-knife or lay-out position (see Fig. 1, page 157).

The double somersault is executed in the same manner except that greater height is necessary and the turn is made more vigorously and rapidly with the body well tucked.

FAULTS

A correct dive is prevented by:

Jumping out instead of up.

Failing to vigorously throw the head and shoulders back or tuck sufficiently.

Failing to swing the arms with sufficient vigor.

Executing the tuck too late, resulting in a semi-sitting position entry.

Failing to straighten out in time for the correct entry.

Forward Somersault

FIRST STEP (Land practice):

When first attempting the somersault (or fancy diving) it is most helpful to get the feeling of the movements during the tuck by having your body suspended in a harness regulated by the instructor.

SECOND STEP (Water application):

However, if the use of harness is not possible, attempt the forward somersault in somewhat the same manner as the backward somersault. Obtain great height, then quickly tuck the body by vigorously throwing the bent arms back and close to the side, duck the head forward, attempting to have the chin touch the knees. Simultaneously draw the knees up, grasp the ankles and feel that you are trying to pull the heels back and up (see upper figure, page 145). Then throw the head back, slightly arch the body for the feet-first entrance.

THIRD STEP (Forward somersault in the jack-knife and lay-out position):

When you have learned the somersault in the tuck position, practice it in the jack-knife position. Eventually attempt this dive in the lay-out position.

Forward One and a Half Somersault

FIRST STEP (Learning forward one and a half somersault:

Fancy Diving (Continued): Figs. 1 and 2. Front jack-knife and half twist. Fig. 3. Front jack-knife header. Fig. 4. Diver completing half twist preparatory to entrance.

The principles for this dive are the same as those listed in the forward somersault, except that greater height, more force and vigor are needed, combined with a tighter tuck.

When first learning the forward one and a half somersault, make two complete and rapid turns and enter in a sort of a sitting position. The main difficulty in learning this dive is to determine when you should open up for the entry.

SECOND STEP (Learning to enter correctly):

Now attempt the forward one and a half somersault by spinning quickly and on the descent suddenly lift the head, extending and arching the body for the head-first entry (see page 145; Figs. 3 and 4, page 155). Or perform this dive in a jack-knife position with the arms extended sideward.

The twist may be used in combination with the forward and backward somersaults as a means of variation and increasing your points for competitive diving.

FAULTS

The correct tuck and entry are prevented by:

Failing to get sufficient height, starting the tuck before leaving the board or attempting to raise the arms too high and wide (turning the body back).

Attempting the tuck with the head raised.

Failing to complete the tuck and not using sufficient force.

Failing to properly time the opening for the entry.

Taking it too easily, resulting in an underthrow, and, too late, in an overthrow.

Flying Dutchman (Forward Spring and Back Dive, Half Gainer or Islander Dive)

FIRST STEP (Learning the Flying Dutchman):

This dive may be first practiced from a stand or a running take-off. (If attempting it from a standing position it is best to pad the board so as to protect the head.) The running dive is better suited for the initial attempt, since the novice can obtain more height and clearance. Run the board, spring up and out with the feet leading, bend slightly forward, enter feet first.

Fancy Diving (Continued): Fig. 1. Back jack-knife header. Fig. 2. Back jack-knife dive entrance. Figs. 3 and 4. Forward one and a half somersault and entrance. Fig. 5. Half gainer in half-lever position. Fig. 6. Back dive, starting descent.

Second Step (Flying Dutchman):

When you are sure of sufficient clearance attempt the dive by getting the maximum of height, *elevating the hips,* arching the back and vigorously throwing the head and arms back. Enter with the body slightly arched, close to the board.

Third Step (Lay-out style of the Dutchman):

Stand on the end of the board, toes gripping the edge, arms at the side. Spring up and out. As the spring is made, arch the body by *elevating the hips,* while vigorously throwing the head and shoulders back. When you reach the top of the spring the waist is leading, the body assuming a gentle and graceful arch backward (see upper figure, page 147). The legs follow the curve of the body on its descent (see center figure, page 147). Enter facing the board, at an angle of about eighty-five degrees, body well arched, toes pointed (see lower figure, page 147).

Or practice the half gainer with a run which affords you more height and better form.

Fourth Step (Half-lever position (or pike style) for the Dutchman):

Spring up and out, raising the feet, and touching the ankles, somewhat as in a jack-knife position. Then quickly arch back and enter the water as previously described (see Fig. 5, page 155). Some find it easier to learn the dive in this manner.

Flying Dutchman Somersault (Full Gainer or Mollberg Dive)

Perform the full gainer in the lay-out position. You should attempt to get greater height and a more forceful backward arch and throw of the head (see Figs. 1 and 2, page 149). When the full turn is completed, straighten the body out, enter feet first with the body almost perpendicular, back slightly arched, toes pointed, arms pressed against the sides.

Faults

The correct gainer position is interfered with by:

Not getting sufficient height for the dive.

By trying to get the feet up instead of having the *waist lead* at the top of the spring and backward arch, the feet following.

Forgetting to forcefully throw the head back and arch sufficiently.

Entering with an overthrow, caused by throwing head too far back.

Fancy and High Diving: Fig. 1. One and a half back somersault in full lay-out position. Fig. 2. Albert C. White and Paul des Jardines, national diving champions, performing swan dive from high platform. Fig. 3. Head-on view of swan dive, Lillian Fergus.

Header Dives

Various combinations of dives, as the front, back, front and back jack-knife dives and somersaults, may be performed with the hands held at the sides during the entire dive (see Figs. 1, 2 and 5, page 151; Fig. 3, page 153; Fig. 1, page 155).

5. PLATFORM DIVING

Before attempting platform diving one should be able to perform the required and fancy dives from the low or high spring-boards in good form, possess an unlimited amount of courage and have sufficient weight.

The fundamental principles of platform diving are similar to those of spring-board diving, with the exception that the diver's height is obtained from his own spring and arm swing; that the head and arms are not used as vigorously to effect a change in position; that somersaults are performed in the lay-out position; that a good dive, as well as a safe dive, is dependent upon the correct take-off and entry position; and that the diver must have an unusual coördinative ability, an exceptional sense of his position while performing a dive, as well as an accuracy for judging distance.

First master the plain high dive in good form. Concentrate your attention upon the easy take-off, as balance is lost, then spring up and out. At the height of the dive the body should be nearly horizontal, well arched, head up, arms sideward. While holding this position, the body gradually tips forward (see Fig. 2, page 157). When about ten feet from the water, lock the thumbs, cover the head with the extended arms, tense the body, and enter at an angle of about 75 degrees. When the entire body is submerged, regain the surface by raising the head and arms.

Once the plain dive is mastered, proceed with the fancy dives, learning the forward-, then the backward-dive combinations, while being coached by an expert.

Review Questions

1. What are the required dives?
2. Describe the correct form for the swan dive and how the arch is attained.

3. How can one obtain the best jack-knife position (front and back)?
4. What factors contribute toward attaining the maximum height and correct position in back jack-knife dive?
5. What factors aid you in performing the twist?
6. Is the principle the same for all twists?
7. How is sufficient impetus gained for performing the somersault?
8. Do you follow the same principle for the forward and backward somersault?
9. What must you do in order to master a double somersault?
10. What essential factors control the correct body position for the gainers?
11. Do the same principles apply for performing the gainers in a half-lever and a lay-out position?

CHAPTER VII

HOW TO TRAIN FOR COMPETITIVE SWIMMING

The swimmer who desires to enter competition should follow a definite routine of training so as to gradually improve his physical condition and endurance, develop his speed through correct swimming form and establish the proper mental attitude.

The usual tendency of the prospective competitor is to sprint. In his attempt to negotiate his distance at top speed he forgets form, covers the distance by wildly thrashing his arms and legs. This method usually results in muscular tension and, if not properly supervised, may cause heart strain.

The value of correct swimming form and endurance cannot be overemphasized. This is developed by slowing down the stroke to a little more than half the racing speed and by gradually increasing the distance from two hundred and twenty yards to eight hundred and eighty yards. By this procedure the coach is better able to detect the faults, and the student can concentrate upon the major points, such as breathing, arm and leg movements and the body position.

By covering your distance at a moderate pace you are able to study your stroke and apply the corrections suggested by the coach. To illustrate: swim a few laps concentrating just on the leg thrash, its depth of drive and movements of the legs, ankles and feet. Next, turn your attention to the arm technique during the catch, drive and recovery. Correct the shoulder position, make sure that you do not have a double roll; that is, that the top shoulder does not drop or lead during the top-arm catch and pull, and that the body is well planed. Lastly, concentrate upon the timing of the breathing, of the head with the top arm and the correct timing of the stroke, body position, etc.

To develop the power of the crawl kick, practice propelling yourself the length of the pool while holding on to a small surfboard, water-wings or other floating supports. The arms should be extended, the head raised so as to exaggerate the back arch,

which is necessary to obtain the correct planing position, and to lower the feet below the surface so as to obtain the greatest driving power toe in and turn regularly to breathe.

One of the best means for developing shoulder-and-arm power is to practice swimming with the head raised, shoulders even, using the arms alone. Or rest the ankles over a pair of water-wings or life-buoy while you propel yourself with the arms alone.

In training for any event, from the fifty yard to the four-forty yard dash, swim from a quarter to a half mile daily. Gradually increase your distance from one hundred to eight hundred and eighty yards by adding a few laps during each practice. If you have acquired form and relaxation you should not feel any strain from the effort. Not only is a daily quarter of a mile swim a good method by which to study and acquire the correct stroke but it is one of the best forms of physical exercise. Swimmers should be encouraged to engage in distance swims rather than just the sprints.

Include a few dashes or sprints during the weeks when training. Also practice racing starts and follow each with a few strokes. Execute the turns for speed (press hard against the side of the pool, instead of holding on to the rail, and spin around quickly), follow each with several strokes as though in a race. This practice is most important, as many of the shorter dashes have been won or lost by a speedy start, turn or finish. When in competition be your own pace-setter.

The coach should not time the swimmer often. It usually makes the swimmer nervous and he sacrifices form in his endeavor to attain speed. It is better to time the swimmer without him knowing it. Or post the time made by all competitors during the informal monthly meets.

Some swimmers develop more rapidly than others, and the coach or the prospective competitor should not become discouraged if record-breaking prowess is not manifested early. Some swimmers require two to three years to develop championship form and then may surpass others who were developed in less time.

The success of the champion hinges upon his innate ability, physical stamina and mental attitude as well as endurance and form. You may have a perfect stroke, be able to swim distance without tiring, and yet, lacking in natural ability, could not

reach championship speed. You may possess unlimited power, innate ability, but swim with such poor form that you defeat yourself.

Just as swimmers differ in form, build and endurance, they also vary in their mental reactions. Some swimmers are very easily disheartened, and need constant encouragement. Then there is the opposite type, the overconfident. An occasional defeat reduces his egotism and replaces it with a desire for practice and a readiness to receive coaching. The coach should use tact in handling the various types, meeting their individual differences with encouragement, constructive criticism and suggestions. The swimming director should serve in the capacity of friend and adviser and not as a dogmatic dictator or tyrant. By being cheerful, having a sympathetic understanding of your team, you will enlist its coöperation and create a feeling of good fellowship, invariably resulting in the team's success.

One's diet or health habits should not differ greatly when training for swimming meets, for it should be nothing more than following common-sense principles and living normally every day. Your diet should be well balanced, consisting of plenty of green vegetables, fruits and water. Smoking and drinking should be abandoned. At least eight hours of sleep are necessary.

The coach assumes a position of great responsibility, for not only is he a means of developing a team but, through his position, he is able to inculcate ideals and standards of good sportsmanship. The swimmer should enter the sport for the physical benefits and mental exhilaration attained and with a determination to win for his school or club rather than for selfish motives of personal glory and awards. A higher motive for entering should be for the opportunity which it affords him to serve his fellow man in the work of life saving. Again, the highest ideal of good sportsmanship should guide his conduct whether he wins or loses.

CHAPTER VIII

HOW TO MANAGE A SWIMMING MEET

1. DUTIES OF MANAGER, COACH OR ONE IN CHARGE

The manager or coach should make the preparatory arrangements so as to avoid confusion or delay.

(1) Attend to newspaper publicity.
(2) Provide seating accommodations for spectators.
(3) Issue and have tickets sold.
(4) Appoint responsible ushers.
(5) Inspect the pool and provide the necessary equipment.
  (a) Inspect diving-boards, plunging platform, and all equipment which is to be used.
  (b) Have the water temperature regulated to about 74° F., and the room well ventilated, temperature about 76° F.
  (c) Mark off the lanes by means of lines on the bottom of the pool, or ropes, preferably those supported with cork floats.
  (d) Provide tape, or light rope, for the finish of the plunge or race.
  (e) If water polo or water basket-ball is played, supply the necessary goal standards and balls.
  (f) The pool must be sixty feet in length if a swimming record is to be given national recognition, and seventy-five feet if a record made is to be given international recognition.
(6) Make sure that the officials are supplied with the following:
  (a) Stop-watches.
  (b) Revolver (.22 or .32 caliber) and several dozen blank cartridges.
  (c) Score-board and score-cards, diving score-sheets, all with pencils attached.

(d) Rule-book.
(e) Whistle.

(7) Provide the swimmers with the following:
(a) Blankets.
(b) Sheets.
(c) Towels.
(d) Suits, if necessary.
(e) First-aid box.

(8) Prizes.

2. OFFICIALS AND THEIR DUTIES

In order to run off a meet effectively, avoid unnecessary delays and disputes by choosing capable, experienced and unbiased officials.

Starter

The starter must be thoroughly familiar with the rules, and should be experienced. When ready to start the race he shall make sure all officials are in their places. He shall then explain the method of starting to the contestants, so as to avoid confusion and false starts; the distance and finish of the race. He should then stand to the side and a little in front of the contestants. If the contestants start before the signal and fail to return they are disqualified.

Judges

There shall be at least three judges who will judge the finish of the race and determine the first, second, third and fourth places. If possible have two judges for first place, standing on opposite sides of the finish line. All judges and timekeepers should view the finish of the race from the side, instead of standing over the contestants, this to more accurately determine the winner.

Timekeepers

Use the standard one-tenth-of-a-second stop-watch. Timekeepers should compare watches before the meet. The timekeepers start and stop their watches at the start and finish of the race, the official time being determined by agreement of two out of the three watches. If all differ, the middle time is considered the official time.

Clerk of the Course

The clerk of the course should be an efficient, wide-awake manager. He is provided with the names of the participants and gets them ready for the events, heats or handicaps. Being thoroughly familiar with the events, he can have the contestants ready an event or two prior to the one in which they are to participate. The clerk of the course is largely responsible for the efficient management of the meet, and avoiding unnecessary delays.

Scorer

The scorer should keep a record of the results and time of each event on his individual score-card, then tabulate the results on the score-board. The scorer must obtain his information from the referee, head judge or timekeeper and hand the results to the clerk of the course.

Announcer

The announcer must first command the attention of the audience, then clearly announce the results of each event.

Referee

The referee shall enforce all rules and settle all disputes covered by the rules.

3. PROGRAM SUGGESTIONS FOR CLOSED MEETS

Closed meets are valuable as a means of stimulating interest and encouraging many to participate instead of featuring a few.

A medical examination, combined with proper supervision, is necessary to safeguard the contestants. No competitor should be allowed to enter more than three events.

When conducting a swimming meet for your club or school, the program should be diversified. Form and speed swimming should be included as well as events for the beginners, intermediates and advanced students. By varying the program with feature stunts, games, races and diving, competition is made more enjoyable and it also enables the contestants to rest between events. If form-swimming contests are held, there should be definitely agreed-upon standards used, so that the compet-

itors, coaches and judges know what to expect, otherwise confusion and dissatisfaction result.

The competitive programs suggested for each section are derived from the Swimming and Life-Saving Tests, Chapter X, page 220; also Chapter XI, page 227. Arrange the order of events to suit your needs.

Program of Events for Beginners

(1) The face-submerged push-off and glide, 20 to 30 feet.
(2) The sculling-stroke race, 15 to 25 yards.
(3) The elementary back stroke, for form.
(4) The preliminary-crawl race, 15 to 25 yards.
(5) The side stroke, for form.
(6) Treading water in the deep area of the tank.
(7) Dive or jump into deep water, regain the surface, swim a few yards, using any stroke, sink and "save self," repeat three or four times, while covering a distance of 15 to 25 yards.
(8) Tandem swimming, using the elementary back stroke, sculling stroke or crawl.
(9) Life-saving stunt races—the candle race, umbrella race, etc.
(10) The game of fox and ducks. Use any additional stunts, races or games which the beginners may choose.

Program of Events for Intermediates

(1) Swimming medley for form: Swim four lengths of the pool using the back, sculling, side, and single overarm strokes in turn (or swim two different strokes during each lap).
(2) Free style, 20 to 25 yards. (Use a racing start.)
(3) A plain dive in good form.
(4) The grasp, the release and swim. Teams start from opposite sides of the pool, swim to the center, collide and grasp each other. Effect a release and continue swimming to the opposite side.
(5) Surface diving, bringing up objects.
(6) Life-saving rescue race, using rear or hair carry, 20 to 25 yards.
(7) Balloon race, tandem crawl, varsity crew, fancy floating, bicycle race, King Neptune's call and any other combination of games or stunts.

Program of Events for Advanced Students

(1) Tandem crawl and back crawl.

(2) Free style, 50- and 100-yard dashes, or a 440-yard event.

(3) Racing back stroke, 25 or 50 yards.

(4) Diving the required dives and two or four optional dives.

(5) The relay.

(6) A rescue. Demonstrating the correct approach, any break, if caught, carrying for 25 yards. Use fireman's carry or lift from the pool and demonstrate the prone-pressure method of resuscitation for three minutes.

(7) Obstacle race, swimming with hands and feet tied, disrobing and old-clothes race, poison tag, under the bridge, the tea party or stunt diving.

General Program for a Closed Meet

This general program should be given once a month if possible, since it helps to prepare the swimmers for open or championship competition.

A good program should not be too long, but consist of five or six events, especially if some of the races are handicap events and must be run off in heats.

Handicaps are necessary to make an interesting race between the contestants where there is a decided difference in their time. The best or *scratch* swimmer is so handicapped that the slowest or *limit* swimmer would have a chance to win.

Suppose we have four contestants entered for the one hundred-yard dash: First, arrange their names and time in the order of the best time made (the scratch swimmer) to the slowest time made (the limit swimmer). Second, to determine the handicap, or allowance, given each participant, subtract the time of the scratch contestant from the time of each succeeding swimmer. Third, to obtain the starting-mark of each, subtract the time of each succeeding swimmer from the limit contestant. Fourth, to check the correctness of your figures, the total of the starting-mark and allowance of each contestant must be equal to the allowance given the limit swimmer. To illustrate:

Name	*Time*	*Allowance*	*Starting-Mark*	*Total*
Jones (Scratch)	59 Sec.	0 Sec.	11	11
White	62 Sec.	3 Sec.	8	11
Smith	64 Sec.	5 Sec.	6	11
Chambers (Limit) ...	70 Sec.	11 Sec.	Go	11

4. PROGRAM SUGGESTIONS FOR OPEN MEETS

(1) Free style, 50 or 100 yards.
(2) Back stroke, 100 or 150 yards.
(3) Breast stroke, 100 or 220 yards.
(4) Free style, 220- or 440-yard dash.
(5) Fancy diving.
(6) A junior or senior championship or invitation event.
(7) The relay.

5. SWIMMING RULES AND METHOD OF SCORING A DIVING CONTEST

For full particulars concerning the official swimming rules and methods for scoring a diving contest refer to the Amateur Athletic Union Rule Book or the Intercollegiate Official Rule Book.

CHAPTER IX

LIFE SAVING

How needless is the yearly death-rate due to drowning! Yet, did it ever occur to you that you are responsible? That is, you are responsible if ignorant of the fundamental principles of swimming and life saving. If you have ever witnessed the frenzied struggle of a person drowning, you could not help but feel your guilt, standing by unprepared to offer assistance. The majority of drownings occur either because of ignorance on the part of the victim or the rescuer.

The prime cause of this frightful loss of life is that so few individuals are prepared to render assistance. The percentage of those who are able to swim is very small and, out of the thousands who know how to swim, fewer still have any definite, or clear, idea as to the method of procedure in case of an accident in the water. Many individuals with no knowledge of the methods of rescue heroically but foolishly lose their lives in the endeavor to save a drowning person. If this loss of life is to be reduced the percentage of persons equipped to give aid must be increased. The test of true citizenship is to prepare yourself to meet the needs of your fellow men.

Life saving in its broadest sense should consist in adequately training the expert swimmers to save the lives of others; then, to reduce possible drownings, by *teaching every individual how to save his own life.* The popular axiom, "Every person a swimmer, every swimmer a life-saver," stresses going to the rescue after the damage is done, instead of preventing it by first properly schooling every one. Our goal should be: *Every individual a swimmer and every swimmer his own life-saver, then, if properly trained, the life-guard of others!*

Due to the unsystematic methods employed, and because of the general lack of national support and supervision, most life saving is carried on in a haphazard manner.

The breaking of many of "the death-grips" now taught

by instructors are really not practical, only giving false confidence and resulting in the student overrating his ability. The line of demarcation between the practical and the impractical only can be reached by constant practice of the most effective and tested methods, which must be practiced with a competent instructor. The release and rescue methods should be made realistic and typical of an actual drowning, so that the rescuer will be able to apply the breaks and carries under the most adverse conditions.

The United States Volunteer Life Saving Corps was formed in 1870 and established nationally in 1890. It is the oldest life-saving institution in America, hence the mother life-saving organization from which all others have sprung. As a result of years of study and actual experience this organization has obtained some of the most practical methods in life saving.

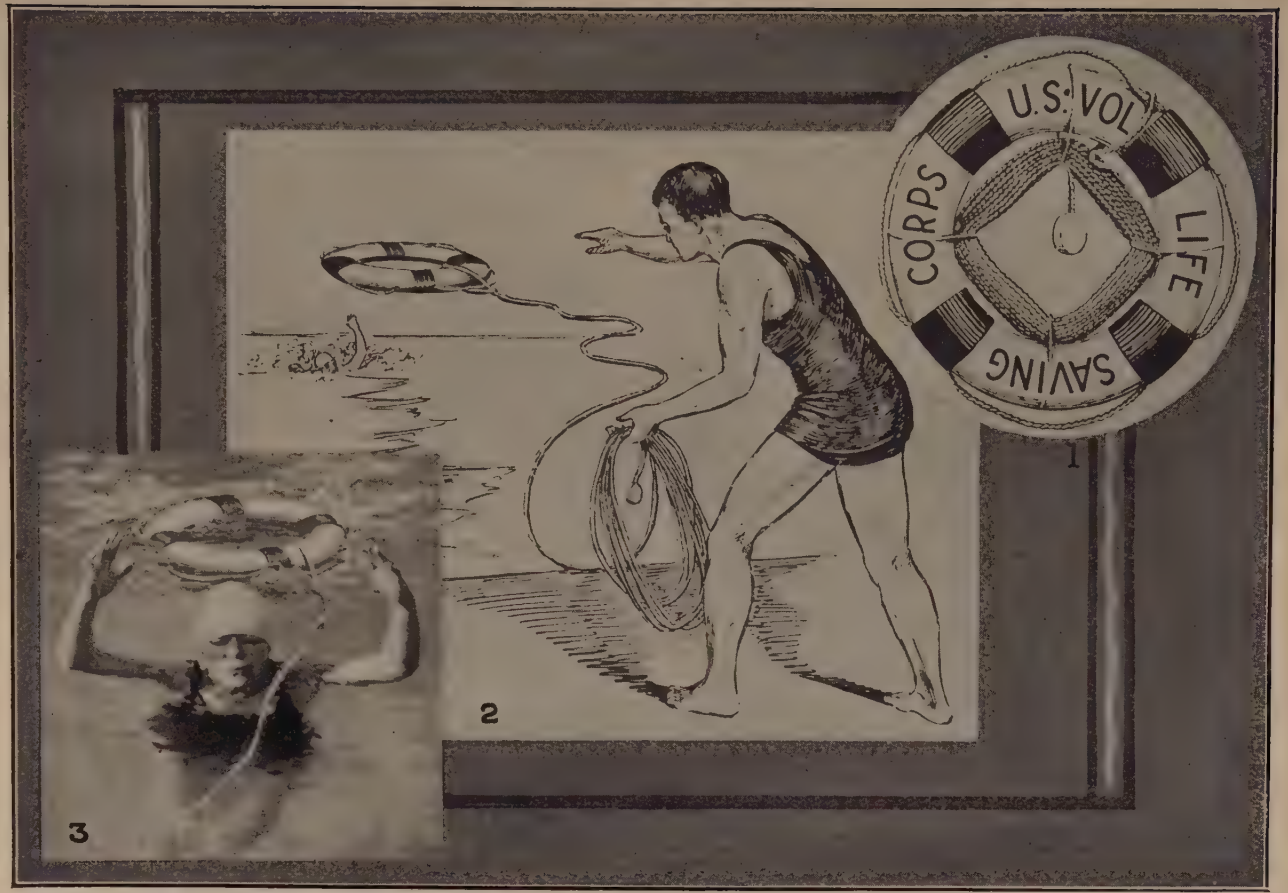
1. METHOD OF PROCEDURE FOR ACTUAL RESCUE

Danger Signals of One in Distress

Struggling and Shouting for Help: When a person is drowning he usually throws up his arms and calls for help. This, combined with swallowing the water and choking, sinks the body. The struggles may be prolonged and then cease for a time, allowing a rise to the surface again, though perhaps not sufficiently to obtain another breath of air. If still conscious, the one drowning will renew struggling, more feebly, perhaps, but with the same result, as soon as insensibility or suffocation occurs the body sinks altogether owing to the loss of air.

Body Sinking: The general belief that a drowning person must rise three times before finally sinking is a fallacy. The question of whether he rises at all, or how often, depends entirely upon the amount of air in the lungs. Sometimes a person may rise only once. Then again, persons have been known to rise eight or more times, while others remain struggling near the surface for several minutes before disappearing. There are no set and fast rules that one can depend upon, as each case is an individual one.

Boat Capsized: Another signal of distress is a capsized boat or canoe. The occupants may be pinned under the boat, struggling or holding on to a support.



To the Rescue: Fig. 1. Life-buoy properly coiled ready for use. Fig. 2. Life-buoy in action. Fig. 3. Life-buoy in proper position at end of throw.

2. TO THE RESCUE

Size Up the Situation

Quickly but calmly determine the best method of rescue and act accordingly. *Lose no time!*

If you cannot swim, do not jeopardize your own life by attempting to rescue one in distress. Even expert swimmers are not qualified unless thoroughly familiar with rescue methods. Many confident swimmers have overrated their ability and, not having studied the art of life saving with their swimming, invited disaster.

First, Throw Object for Support

When effecting a short-distance rescue, say from fifty to seventy-five feet, if possible throw any object which will keep the person afloat until assistance arrives, such as life-ring, can-buoy, wooden box, inflated automobile tube, oars, or anything buoyant (see Figs. 2 and 3, page 171), then swim to his assistance.

Second, Row to the Rescue if Possible

In making a distance rescue, in a lake or stream, row if possible instead of swimming (see Fig. 1, page 213).

If you are obliged to rescue some one in the surf or rough water, it usually takes considerable time to launch a boat. Therefore it is necessary to start swimming immediately, preferably with a belt and line regulated by an assistant (see Fig. 1, page 215). If this is not available, swim out, rescue the victim and place him in a floating position until the boat arrives.

Third, Swim

Quickly but calmly determine the best method of procedure. Remove shoes and heavy outer clothing. When the rescue necessitates diving into unknown waters, jump feet first or in a sitting position.

If you are the only one near and there is a cry for help, do not "lose your head." Keep your eyes on the person or, if he has disappeared, on the spot where last seen. Swim out with a steady stroke, conserving your energy for the rescue and the return with the distressed person.

When the exact spot of the body's disappearance is not

known, look for bubbles. In calm water they will rise perpendicularly. In case of a current or a tide the body will be carried a considerable distance with it. Make a thorough search for the body by repeated dives, bearing in mind the section which has been explored. When searching for the body look down, then up toward the surface.

Surf Rescue

In making a rescue in the surf, one must be governed by circumstances, using his judgment as to which method he will adopt in conveying the drowning person to the shore.

One often hears of a person heroically giving up his life in a surf rescue. This individual in his eagerness to save a life is forgetful of his own peril. Overrating his strength, he plunges into a heavy surf and reaches the distressed person almost exhausted. He usually becomes completely fatigued while struggling to save the victim, and either goes down or attempts the return in this feeble condition, resulting in the double casualty we read about.

Before attempting a surf rescue use any available aids. If a life-buoy or life-jacket is not procurable, substitute with an inflated automobile tube, etc. If a rope is handy secure it about your body and have the line regulated by an assistant on shore. If a surf-boat is obtainable, use it, and follow up the rescue immediately. In this case, the rescuer should float or tread with the subject until assistance arrives.

On this subject the New South Wales Surf Life Saving Handbook reads as follows:

"If the rescue is to be made by a crew equipped with a reel, line and jacket (see Fig. 1, page 215), proceed as follows: Have the guard or beltman go through the surf while the line is being carefully regulated by the linesman and reelman. While going to the rescue avoid hopelessly wasting your strength against an adverse tide, current or stream. In going through the surf it is best to take a deep breath just before the breaker strikes you. Never try to remain on top of the breaking surf, always plunge through.

"On reaching the subject, the guard should determine his condition. If patient is calm, speak to him quietly, as many of the rescued are swimmers who are exhausted by long battling with the waves. This will often have the desired effect of

calming him, for a calm word often brings confidence to a despairing mind. If the subject is violent and looks difficult to handle, keep a safe distance from him (see Fig. 1, page 175). His struggles will shortly weaken and a good hold can be secured. Rescuers should never strike and render unconscious a patient, as an unconscious body generally sinks immediately.

"If you are accidentally clutched by your victim, be calm, take a deep breath, submerge and employ your most effective break. Remember that it is comparatively easy to effect a release under water, since the subject quickly loses his strength and endeavors to climb to the surface.

"Approach your victim from the rear, place him in a back-floating position. On the signal given to pull in, the guard should lie in a horizontal position, not sit up in the belt. This will eliminate his being drawn under the water with his patient, no matter how fast he is pulled in from the shore.

"If the guard is overtaken by an incoming wave in the act of breaking while being drawn in, he should immediately take a firmer hold of his subject and bend forward to go through the wave so as to miss the full force of the water at the crest of the breaker, which may otherwise cause him to lose his subject.

"When the surf begins to break, you are in shoal water of about ten feet in depth. A strong undertow is generally felt between the break and the beach. As soon as the life-guard stands, this will be a signal for his assistants to come to his aid to help take the subject to shore, using a fireman's carry. If the subject is not breathing start resuscitation immediately, otherwise treat for shock.

"Considerable responsibility falls on the first linesman. He must watch his beltman or guard carefully for signals, and must make doubly certain that the patient has been secured before drawing in. The linesman should secure the patient quickly and start resuscitation instantly, as seconds may be the dividing time between a successful case and death.

"The reelman should see that the line is wound on the drum in such condition that if necessary it could be used immediately for another rescue without fouling or tangling."

Some surf rescues have been made by riding a horse a short distance into the breakers and throwing the distressed person a life-buoy or line.

The Approach: Fig. 1. Rear approach, struggling person. Fig. 2. Front approach, struggling person. Fig. 3. Front or wrist approach and turn.

Ice Rescue

In ice accidents, a person precipitated into the water usually comes to the surface close to where he went in. He should then extend his arms over the broken edge of the ice and hold on until help arrives. Or where the ice is thin he can move forward by breaking it in front of him. In this way it is possible to reach the shore. The ice in the vicinity of a break is seldom strong enough to climb upon when encumbered with heavy, wet clothing. To get out in this way is not an easy task, and it is generally best to wait for assistance.

Rescuers should look for ropes, fence-rails, ladders, etc. A coat or hockey-stick may be reached out to a person in the water. The easiest way to render help is to use a long ladder or board, crawl on this to the rescue. In this manner the weight is distributed over a large surface, and the ice, therefore, is able to bear a greater weight. If the break in the ice is only local, two persons can get on opposite sides of the break, each holding the ends of a rope, while allowing the center of it to drop to the victim.

When making any rescue on the ice it is best to keep the body low, in a crawling position. This distributes the weight. It also prevents you from slipping and you are near the victim when you arrive at the break. He cannot pull you down nor can you fall and make another break, if you keep spread out over the ice.

Rescuers may form a chain while crawling out on the ice and take hold of each other's ankles.

River skating is especially dangerous, and great care should be observed. Skating should not be attempted by any one alone after dark or when the ice is covered with snow. Look out for bridges, sharp turns and narrow passages, where the water is deep and the current strong. It is best to carry a hockey-stick, with twenty feet or so of stout fishing-line or braided sash-cord, as a means of effecting a rescue.

3. THE APPROACH

To approach a drowning person face to face is foolhardy, often involving danger. To rush headlong into the grasp of such a person invariably means the loss of two lives. Remember

that most drowning persons are irrational, panic-stricken and, in some cases, maniacs. Save your energy for any emergency which may arise. You must bear in mind that, after you have reached the subject, you not only have the same distance to return but, in addition, must tow a body. This is not accomplished as easily as you have been told.

Approaching Calm Person

There are different methods of approach but, if possible, always *approach from the rear* (see Fig. 1, page 175). In swimming-pools or places where the victim is close to the shore (that is, where eight or ten strokes means safety) one does not become as frightened. According to the circumstances, it may be well to speak to the alarmed person. Assure him that by assuming a back-floating position he will be rescued. Of course you must remember that most persons fearing drowning lose all power of comprehension, so this method would only apply in certain conditions; that is, a friend in distress, some one that has confidence in your ability, a tired swimmer or one affected with a cramp.

Approaching Frantic Person—Rear Approach

In surf, lakes or rivers, where aid is distant, the victim is easily discouraged and generally becomes panic-stricken. An approach of this type requires great caution and should be *from the rear* (see Fig. 1, page 175). It is sheer madness to approach a drowning person from the front, especially if the victim is viciously fighting and clutching at anything, and it would not be of any advantage to talk to him. He could not hear you, and having lost all power of understanding could not follow your instructions. So conserve your strength. Do not lose sight of the fact that you have everything in your favor, the victim having "lost his head" is rapidly playing himself out. Each moment of struggling means that he is so much weaker, while you are calm and collected with full powers of understanding, hence your advantage.

While in the rear of the victim, if he attempts to turn toward you, stay him off by placing your hand on his near shoulder, arm extended, and turn with him, thus safeguarding yourself, while waiting for an opportunity to use the rear or hair carry.

Or if the struggling person reaches for you as you are attempting the rear approach, grasp his right wrist with your right hand and spin him around, so that his back is to you and in position for the rear carry (see Fig. 3, page 175).

Front Approach

You may accidentally find yourself face to face with a drowning person who is about to grasp you. Protect yourself by drawing up your knees in readiness to extend, and, if necessary, force him away (see Fig. 2, page 175). Then safeguard yourself by quickly swimming away from his grasp and approach him from the rear.

4. THE BREAKS

The following introduction of this subject is taken from the New South Wales Surf Life Saving Handbook:

"The breaking of holds or grips on rescuers by drowning persons is too extensive a subject to be dealt with fully. But there are some general principles which can be laid down for the guidance of life-savers.

"The clutches of a drowning person are deadly in the extreme, and unless the rescuer is well versed in water wrestling he will in all probability be imperiled. Therefore it is imperative that every life-saver learn the various releases and practice them regularly to become efficient, also to gain confidence in his own ability.

"Remember that the subject's arms are stronger at the wrists and toward his shoulders, while his legs are stronger still. Therefore, most encircling grips can invariably be broken at the midarm, but beware of leg holds, as often excessive pain and force must be given to disengage these grips.

"The breaks should be sudden and not necessarily injurious to the patient, though at times pain may be the only means of obtaining release. However, remember that the most violent patient if held under water soon becomes submissive!"

After releasing yourself from the grasp of a person who is struggling violently, do not attempt to assume a carry position but stay him off remaining at a safe distance. Then as his struggles become more feeble, approach from the rear and assume a carry position.

Wrist Breaks: Fig. 1. Wrist break in violent case. Fig. 2. Breaking double-wrist grasp. Fig. 3. The turn.

Wrist Breaks

Single Wrist Breaks: If a subject grasps one of your wrists with both of his hands, his thumbs on top, release yourself by reaching over with your free arm and grasp your hand (see Fig. 1, page 179). Inhale, then quickly pull upward, this leverage against his thumbs will free you.

If the subject should grasp you with his thumbs under, break by pulling down.

For the tenacious case, break by placing one or both of your feet against the subject's body. Then break by slowly and forcibly extending your legs.

Double Wrist Breaks: When both wrists are grasped with the subject's thumbs underneath, free yourself by first slowly raising your hands, then suddenly swinging them down and out (see Fig. 2, page 179). If the subject's thumbs are on top, break by swinging up and out.

Front Breaks

Neck Breaks: If grasped about the neck with the subject's arms extended, free yourself by first placing your hands under his elbows (see Fig. 1, page 181). Then take a deep breath, duck under while forcing the victim's arms up (see Fig. 2, page 181). Turn him away from you and assume the carry (see Fig. 3, page 181).

When clutched tightly about the neck (see Fig. 1, page 183), free yourself by placing your arms over subject's, clasp your hands and place the palms on his chin (see Fig. 2, page 183). Then quickly extend your arms, forcing his head back. This usually effects an immediate break (see Fig. 3, page 183). However, in a violent case accompany this movement with a forceful knee pressure against his abdomen. Then turn and carry.

Body Break: If the subject grasps you tightly about the body, pinning your arms to your sides, effect a release by first taking a deep breath, then lean well over the victim, place one hand on the small of his back, pass the other *over* the subject's arm, placing the palm of your hand on his chin, with your fingers closed over his nostrils (see Fig. 1, page 185). At the same time place your knee against his abdomen. Then quickly force his head back by extending your arm and exerting pressure with the knee (see Figs. 2 and 3, page 185). Turn and carry.

Neck Breaks: Fig. 1. Front neck hold. Fig. 2. Front neck break, lifting subject's arms and ducking under. Fig. 3. Turn preparatory to carry.

Rear Breaks

Rear Strangle Breaks: Free yourself by grasping either one of the victim's wrists or hands with both of your hands (see Fig. 2, page 187). Quickly force his wrist down while turning it in. This lifts the elbow. At the same time duck under the subject's raised elbow, while turning toward him (see Figs. 2 and 4, page 187). Finish with his hand pressed against the small of his back (see Fig. 3, page 187). Then raise the subject's body to a back-floating position by pressing up against his back and raising his chin. Continue with carry.

You may also free yourself in this manner: Grasp the subject's lower hand and twist it down, out and in toward his body. With your free hand grasp his arm at the elbow and lift it. Duck under his arm as you raise it, and continue twisting his hand until he is turned back to you. Use your other hand for chin pull to get his body flat on the surface, then carry.

Rear Body Break: If grasped about the body from the rear, bend your head and body backward (see Fig. 1, page 189), thus gradually placing your body over the victim's and submerging him. At the same time bend or twist your body to the left (or right), place your left leg behind the victim and continue twisting your body until you feel your hip in back of the subject's (see Fig. 2, page 189). Then turn him away from you (see Fig 3, page 189), and assume carry position (see Fig 4, page 189).

Scissors Breaks

Free yourself from a front scissors grip by alternatingly working your legs up and down against the subject's body. Turn and carry.

Release yourself from a rear scissors grip by forcibly twisting the victim's ankles or toes.

5. RETURNING WITH RESCUED

In carrying a person through the water it will be found advantageous to keep the legs well up to the surface and the whole body as horizontal as possible, thus avoiding the drag which would impede progress. The subject's legs may be kept from a sinking position by the rescuer occasionally pushing them up with his knee or foot.

Front Neck Strangle Break: Fig. 1. Front neck hold. Figs. 2 and 3. Breaking, forcibly pressing against subject's chin, forcing head back and under water.

The rescuer must remember that it is most important to keep the face of the drowning person above the water, even if his own at times should become immersed. Avoid all jerking, struggling or tugging, and swim with a regular, well-timed stroke, conserving your strength for continued effort. If this is properly done much confidence is imparted, as the subject is able to breathe with freedom and may cease struggling, feeling that he is in safe hands.

Rear Carries

Hair or Rear Carries: Get in a position directly behind the subject, place one hand over his chin, forcing the head back. At the same time use your knee or free hand to exert pressure against his back, thus raising him into a horizontal position (see Fig. 4, page 189). While holding his chin, start swimming immediately, using your free arm and a scissors kick. After you have started momentum, carry subject by grasping the hair, or bathing-suit at the neck (see Figs. 1 and 2, page 191).

The rear carry is superior to others because it keeps you safely at the back of the subject, thereby giving you full and perfect control. It is easier to free yourself when grasped during this carry, and it also enables you to keep the victim's head and mouth above the water, affording you greater freedom and relaxation while towing him. In this manner you can float when necessary, then continue swimming until help arrives.

Head Carry: Approach the subject from the rear and place him in back-floating position. Extend your arms, placing the palms of your hands over his ears (see Fig. 1, page 193), with the little fingers following the jaw. Tilt the chin upward until his mouth clears the water surface. Assume the head carry, using the elementary back-stroke leg kick or a reversed scissors kick, while tipping the hips slightly to one side. Guard against letting the fingers drop to the neck (which would choke the subject), or carrying him with the arms bent (which would interfere with your stroke).

Side Carries

Cross-Chest Carry: Approach the subject from the rear and place him in a back-floating position. Place your upper arm over his shoulders, across his chest and, if possible, finish with your

Body Break: Figs. 1 and 2. Front body hold, rescuer in position for break. Fig. 3. Breaking body hold, forcing head back and pressing knee against subject.

hand under or near his opposite armpit (see Fig. 4, page 191). At the same time turn on your side, so that your hip is under his body. Then swim the side stroke, using a scissors or reversed scissors kick. While towing the subject constantly watch him, making sure that his face is held above the water. Avoid choking him or permitting his body to drag. If he should attempt to turn toward you, tighten your grasp, quickly turn with him and duck him under. When subdued, continue with this carry.

Side-Head Carries: Starting with the subject in a back-floating position, place your top arm over his shoulder, palm of hand resting on his chin, little finger following the jaw (see Fig. 3, page 191). Tow subject, using side stroke, keeping your top arm straight, his chin elevated. Guard against letting your hand slide down on his throat or neck, as it creates a suffocating sensation, sometimes causing choking.

You may vary this carry by placing the subject's head against your top shoulder, while your bent top arm holds his head in position, just above the jaw line.

Carrying Two Persons

When going unaided to the rescue of two persons who have clasped each other in the drowning struggle, approach one whose back is turned toward you. Use the hair or rear carry. It is not necessary to break them apart, since they are supporting each other and it enables you to rescue both of them.

Cramp or Fatigued Person Carry

This carry is to be used for a rational person or one who is temporarily handicapped by a cramp or greatly fatigued. Swim to the subject, tell him to lie on his back, place his hands on your shoulders, arms straight, head back, then to spread his legs so as to clear your body. Propel him to safety, by swimming over his body with a breast stroke (using a frog or scissors kick) or a trudgen or crawl (see Figs. 2 and 3, page 193). Have the subject guard against bending the arms and assuming a poor floating position. This hinders progress.

6. PRONE-PRESSURE METHOD OF RESUSCITATION

What is drowning? Suffocation.

What causes suffocation? It is caused by having the oxygen

Rear Strangle Break: Fig. 1. Rear strangle hold. Fig. 2. First position for effecting release, turning subject's wrist in and going under his raised arm. Fig. 3. Turning subject around, placing his body in position for the carry. Fig. 4. Breaking rear strangle hold and preparing to turn body.

supply cut off, as in the following cases: the inhalation of various fumes, gases, smoke, exclusion of air, as in a closed vault, confined air, as in a ship's hold, cellars, old wells and mines.

What is the treatment for suffocation? The Schäfer prone-pressure, one-man method of artificial respiration.

There are several methods of artificial respiration. The Schäfer prone-pressure method is considered the best, being widely used throughout the United States, as well as in many foreign countries. Countless human lives have been saved through this method, and it is really the most effective because of its simplicity: it requires only one operator, due to the prone position, and when the tongue has been pulled forward it remains so, thus preventing it from blocking the air-passages. This method approximates natural breathing, filling the lungs with a greater amount of air than in normal respiration.

Preliminary Treatment

Send some one for a doctor at once. Do not wait until he arrives, but proceed as follows: Immediately after the patient has been taken from the water, locate a flat surface. Lay the one to be resuscitated face downward, clear the mouth of all mucus and foreign matter, pull the tongue out and see that it remains out (see Fig. 1, page 205.) (If the jaws are set, the breathing will be accomplished through the nose until relaxation occurs.)

Then straddle the patient, placing your hands under his stomach, clasping them together; in this manner gradually lift the patient a few inches, squeezing and shaking him as you do so (see Fig. 1, page 205), then drop him suddenly. Sometimes a smart slap between the shoulders is helpful. Lifting the patient as mentioned should be done only once or twice, taking a few seconds, as this is merely to move anything which might be blocking the air-passages; it helps to eliminate water from the lungs, if present, and it may also induce respiration.

Treatment

Keep the patient lying face downward on the flat surface. Extend the arms, turn his head toward the wind, rest his forehead on his forearm which is away from the wind (the leeward), and see that the tongue is out. Bend the windward arm so as to protect the face; then face toward the victim's head, and

Rear Body Break: Fig. 1. Body grasp from the rear. Fig. 2. First position for effecting a release. Fig. 3. Turning subject's body. Fig. 4. Placing subject in position for carry.

stand or kneel astride one or both of his knees (see Figs. 2 and 3, page 205; Figs. 1 to 4, page 207). Place your hands upon the subject's lower or short ribs, and exert a steady downward pressure to the count of three (see Fig. 2, page 205; Figs. 1 and 3, page 207). Then quickly relax to the count of two (see Fig. 3, page 205; Figs. 2 and 4, page 207). This movement is continuous, first down, then up, swinging your body to and fro. Continue this method from twelve to fifteen times a minute until there are signs of life; that is, until the patient breathes unaided.

Supplementary Treatment

Have bystanders or assistants give you additional help while you are resuscitating.

(1) Remind some one about the doctor, and send for blankets and dry clothing.

(2) Appoint some one to keep the crowd back.

(3) If necessary have some one remove all tight clothing.

(4) Promote circulation by rubbing the subject's arms and legs upward (toward the heart).

(5) Apply hot flannels, hot-water bottles, heated bricks, etc., to the stomach and armpits, between the thighs, and to the soles of the feet. Should you not be able to resort to these suggestions as to warmth, build a fire on the side of the patient away from the wind (the leeside), but at a safe distance. This would serve the purpose.

(6) Should breathing be temporarily suspended, renew treatment.

(7) Stimulants should not be given by the mouth until after the patient is able to swallow; that is, when the patient is fully conscious: then give plain black coffee, tea or half a teaspoonful of aromatic spirits of ammonia in a glass half filled with water.

(8) The patient should be kept in bed in a quiet, well ventilated room. Pneumonia or possible collapse of the heart are to be feared.

Important Reminder: Resuscitation should be continued for at least an hour. As a general rule signs of life begin to show after a few minutes' work. However, one should not be discouraged if it takes longer. We read of persons having been

Life-Saving Carries. Fig. 1. Hair carry. Fig. 2. Rear carry, struggling person. Fig. 3. Side-head carry. Fig. 4. Cross-chest carry.

revived after being under water as long as fifteen minutes, but this is very rare. If the person you are dealing with has been under water for less than five minutes you have everything in your favor. In any event, do not give up, but commence work at once.

Dr. Sheffield's Method of Resuscitation

Dr. Sheffield's method of resuscitation also has been successfully used for restoring life, for by slightly raising the hips inspiration is aided. In cases of prolonged resuscitation, these two methods may be used interchangeably as a means of relaxing and resting the operator.

Dr. Sheffield explains his method thus:

"First, place the suffocated person on the ground with one arm under his head, as in the Schäfer method. Then stand astride him. Place your elbows between your knees, thus affording greater pressure to the hands, which should grasp the middle of the victim's side, thumbs pointing toward the spine and forefingers following the lower ribs. Force down, in, and up for two or three seconds (see Fig. 3, page 207). Then release and catch under the patient's hip joints. Raise the body so that the ribs can swing forward for one or two seconds (see Fig. 4, page 207). Again release and repeat the entire process from ten to twelve times a minute.

"My experience has proved this to be one of the best methods for restoring life."

The lateral pressure is most effective when resuscitating a subject on a sandy or soft surface. The effect of the pressure on the ribs is not lost, because you are not depending entirely upon the ground for support or resistance.

When resuscitating children, guard against a forceful, downward pressure, as you are likely to fracture the ribs. In this case the lateral pressure is superior because the hands are placed on the ribs at the point of greatest flexibility. Apply pressure slightly faster.

There are no fast rules which can be set down regarding the position of the operator while resuscitating, or whether the arms should be held straight or slightly flexed, or as to the exact position of the hands. The slight variations used in the prone-pressure methods will be determined by the type or build of the subject and your adaptation to the method.

Life-Saving Carries (Continued). Fig. 1. Correct hand position for head carry. Fig. 2. Tired swimmer's carry, using breast stroke. Fig. 3. Tired swimmer's carry, using trudgen or crawl stroke.

Report of the Third Resuscitation Commission on the Use of Mechanical Devices

This commission was composed of fifteen physiologists, physicians, surgeons and engineers, representing medical and technical societies, institutions of learning, bureaus and divisions of the Federal Government, with Dr. S. J. Meltzer of the Rockefeller Institute as its chairman.

The value of the prone-pressure method of resuscitation is very ably expressed by the medical authorities on this commission in the following report:

"With regard to the employment of mechanical devices for artificial respiration, fourteen members of the commission felt that, at present, no definite stand should be taken either for or against any particular apparatus. They recommended, however, that the use and installation of apparatus should be confined, for the present, to properly equipped institutions, under medical direction. Dr. Yandell Henderson, professor of physiology, Yale University, and consulting physiologist of the United States Bureau of Mines, filed a dissenting opinion to the effect that even where mechanical resuscitation appliances are instantly available a victim treated by the manual or prone-pressure method would have the best chance of recovery. Professor Henderson believes that much critical time is lost where dependence is placed upon mechanical appliances, as, in actual practice, the apparatus is seldom right on the spot, adjusted and ready for use."

Physiology of Respiration

The New South Wales Surf Life Saving Handbook explains this subject thus:

"The air reaches the lungs by way of the nostrils or mouth, the pharynx, larynx, trachea and the bronchial tubes.

"The lungs, which are elastic, occupy the greater part of the thorax, or chest, and lie immediately within the ribs. The walls of the air-cells of the lungs are very thin, and over them are small capillaries of the pulmonary arteries and veins, in which are minute blood-vessels: it is here that the purification of the blood takes place. The lungs are the essential organs of respiration. Two in number, they lie on each side of the chest, having between them the heart, blood-vessels, bronchial tubes and gullet.

They rest upon the diaphragm, an arched muscle dividing the thorax, or chest, from the abdomen.

"Inspiration is chiefly a muscular act. It is effected by the muscles of the chest raising the ribs and breast-bone, and the flattening of the diaphragm, which is ordinarily curved upward. This united action increases the capacity of the chest, and air flows in.

"In expiration, which is almost wholly mechanical in action, the elasticity of the distended lungs is sufficient, in quiet breathing, to expel the air by their own elastic recoil; the ribs fall, and the diaphragm again curves upward, lessening the capacity of the chest and forcing the air out.

"Respiration abstracts oxygen from the air and adds carbonic dioxide, watery vapor, organic matter and a little ammonia.

"During health a person breathes or respires (that is, goes through movements of inspiration and expiration) about fifteen times a minute. The amount of air taken in and passed out of the lungs with each respiration is about thirty-two cubic inches.

"The spirometer method for accurate determination of the volume of air removed shows that 175 cc. of air volume was expired in the old Sylvester method as contrasted to the 552 cc. in the Schäfer method. Exerting pressure at the rate of twelve times a minute, the prone pressure gives 240 cc. of air expired and a like amount inspired, thus giving more volume of air a minute than in normal breathing.

"The action of the diaphragm is as important as that of the heart, the cessation of either causes death. Temporary paralysis of the diaphragm results in unconsciousnes, diminished, irregular heart action and the suspension of breathing.

"This condition is caused by:

"(1) Asphyxiation or suffocaton due to a paralysis of the respiratory center in the brain (medulla oblongata), as in cases of drowning, gassing, bad air in wells, vaults, etc.

"(2) Electric shock, the effect of which upon the system may paralyze the diaphragm.

"(3) Traumatic shock also disturbs the nerve centers: it is the result of a blow on the head, neck or solar plexus.

"The prone-pressure method of artificial respiration is not only effective for restoring the apparently drowned but it can

be used in cases of smoke suffocation, gas, electric shock or traumatic shock."

7. PRELIMINARY LIFE-SAVING TESTS

The following tests should be practiced diligently as a preparation for the life-saving tests. The instructor should give frequent theoretical discussions and demonstrations of the work.

(1) Breath Control

Ability to hold the breath is necessary for breaking holds in life saving. Practice until you are able to hold the breath for a minute or more. One may increase his ability to hold the breath by taking deep and forceful inhalations and exhalations through the mouth before submerging. (Refer to page 1, Breath Control.)

Then dive in, remain under water for a minute.

(2) Keeping Afloat

Practice motionless floating and treading water for five minutes. For the individuals who lack buoyancy in the water, substitute a sculling arm movement or tread. (Refer to pages 13 and 24).

(3) Deep-Water Emergency Tests

Review the deep-water emergency tests. (Refer to page 23, Deep-Water Emergency Tests.)

(4) Strokes Necessary for Rescue Work

(a) Swim fifty yards on the back, using the elementary backstroke leg movement or the reverse scissors kick (which is executed by moving the top leg backward and the under leg forward, while turning the body slightly on the side), with arms extended, hands held just above the water surface as though towing a person.

(b) Swim one hundred yards with the side stroke, using the scissors kick, combined with an underarm surface pull. Hold the top arm in carry position. Since the side stroke is used to a greater advantage for towing a subject, practice it, stressing a forceful leg drive while using a scissors or reverse scissors kick.

Release and Rescue Drills: Fig. 1. Wrist break. Fig. 2. Front neck break. Fig. 3. Body break. Fig. 4. Cross-chest carry.

(c) Swim one hundred yards, breast, trudgen or crawl, pretending that you are pushing the helpless one in front of you.

(d) Swim a quarter of a mile without touching a support. If necessary, one may rest by floating or treading and using any combination of strokes. (Refer to page 46, Analyses of Various Swimming Strokes.)

(5) Plain Diving

(a) Perform a racing or shallow dive correctly. (Refer to page 116, Diving.)

(b) Execute a plain dive and jump feet first from a five- or ten-foot platform. When a rescue in unknown waters necessitates diving jump feet first or in a sitting position.

(6) Surface Diving and Bringing Up Objects

It is necessary for one to practice surface diving in order to bring up an object or body.

Swim to a position directly over the object, then with a breaststroke movement lift your hips by a downward stroke, while ducking your head, and doubling up in jack-knife fashion. Try to stand on your head, gradually straighten out your legs and swim breast stroke while using short strokes, so that your hands are nearly always in front of you, thereby protecting your head. Always keep your eyes open, get close to the bottom, turn, look up toward the light, where the sun is shining on the surface. The body will be seen quickly, like a shadow, floating between you and the light.

When the body is found grasp the hair or clothing. If the bottom is firm, start the body up ahead of you, then push off and continue swimming. But if it is soft and muddy, swim to the surface with a forceful leg kick and arm pull. Then use the correct carry method.

(a) Perform several surface dives in six to nine feet of water, bringing up objects light in weight, say two or three pounds.

(b) Execute a surface dive in deep water, and recover a ten-pound weight, swim thirty feet while holding it upon your hip.

Lifting Person From Pool. Fig. 1. Holding subject while climbing out. Fig. 2. Lifting subject. Fig. 3. Turning subject preparatory to resuscitation.

(c) Surface dives, bring a person up from seven to ten feet, swim thirty feet, using a rear carry (see Figs. 1 and 2, page 191).

(d) Dive, swim at least fifty feet under water, using a breast or side stroke while keeping the head down.

(7) Removing Clothes While in the Water

Practice removing your heavy outer clothing as rapidly as possible before attempting a rescue, such as shoes, coat, trousers or shirt.

However, one may be called upon to remove his clothing while in the water as a result of a boat or canoe capsizing.

Undress while in deep water, assume a sitting-float position, with the face free or immersed. First remove the shoes, then coat or vest, trousers or shirt, then continue swimming for a hundred and fifty yards.

For the person who is unable to float it will be necessary to tread or scull at intervals while removing his clothing, or better still, undress while submerged.

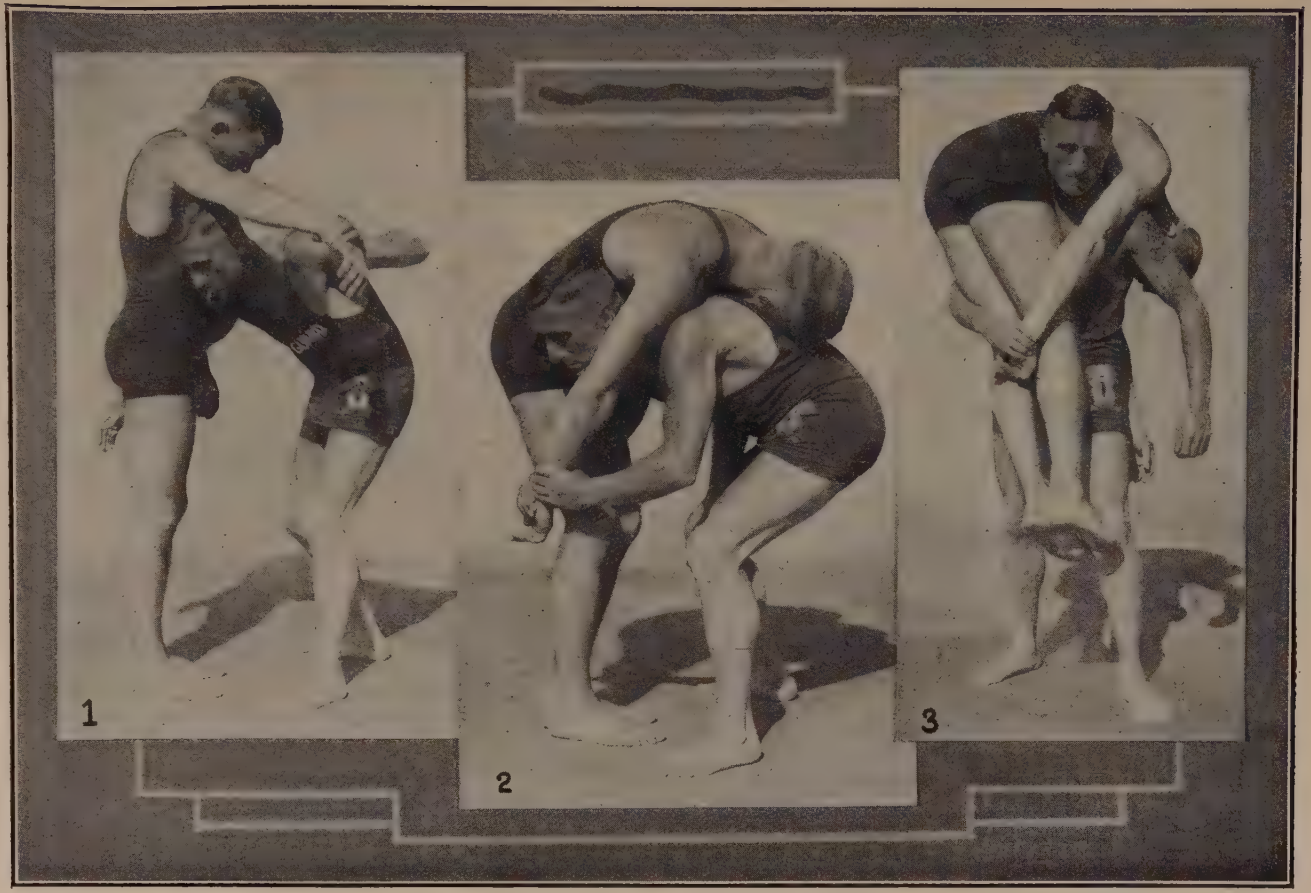
(8) Supporting and Swimming With Clothed Person

(a) Swim at least 100 yards clothed, using any stroke.

(b) Swim at least 50 yards with clothes on, carrying a fully dressed person.

(9) Lifting a Subject From a Pool or Boat

If in deep water, place one of the subject's hands over the edge of the rail or boat (see Fig. 1, page 199), hold it there by clamping your near hand on top, then in the usual manner climb out. Turn him around so that his back will be toward you (see Fig. 2, page 199). Then grasp his right wrist with your right hand, left with your left. Stand with your legs spread while lowering and raising him several times to gain momentum, then, with a final lift, pull him out of the water, so that he is in a sitting position on the edge of the pool, boat, dock or wherever the place might be. While in this position, pull him a few feet or so clear of the edge, and finish with both arms overhead (see Fig. 3, page 199). Then quickly turn the body face downward by dropping one arm in the vertical position and pulling the other over toward you. If necessary make ready for resuscitating the subject (see Figs. 1 and 2, page 205).



Fireman's Carry: Fig. 1. Facing subject and going under his arm. Fig. 2. Placing subject over right shoulder. Fig. 3. The carry.

(10) Fireman's Carry

An emergency may necessitate your carrying a victim from the water, fire or any accident. The fireman's carry is the safest and best carry. If you are bringing a very heavy person from the water just float him to the water's edge and drag him to the place of resuscitation.

Place your subject in a back-floating position in shallow water (see Fig. 1, page 203). Face him standing at his right side, then grasp his right wrist with your left hand and place your free arm at the small of his back (see Fig. 1, page 203; Fig. 1, page 201). Quickly raise his right arm, duck under it while balancing the body over your right shoulder (see Fig. 2, page 203; Fig. 2, page 201). Place your right arm around his legs and grasp the subject's right wrist with your right hand and carry (see Fig. 3, page 203; Fig. 3, page 201). Placing the subject in this position, across your shoulders, affords perfect balance and enables you to have one arm free.

Women should practice this carry with some one their own weight, so as not to strain themselves.

(11) Practice Throwing Life-Buoy or Object and Towing

The knowledge of how to throw a life-ring and tow a person is important, because short-distance rescues demand it.

Throwing a Life-Buoy: The correct way to throw a life-buoy is to hold it flat, in a scaling position; that is, parallel with the water surface (Fig. 2, page 171). Do not toss it with the edges up and down, because in this way it cannot be accurately thrown and it offers too much resistance. The line should be held in the opposite hand with the running end free to run out as the buoy travels (Fig. 2, page 171).

All throws should be made to just pass your subject a foot or so (Fig. 3, page 171). Should everything work as you intended, haul in on the line the extra foot that went by the subject. In a second the buoy will be within reach of the victim. Generally, your own judgment of wind, current and other elements falls short of what you anticipated. In this case, it is impossible to push the life-ring the additional foot or so necessary to reach the victim. The only thing left for you is to haul the buoy in, coil the line and try again. All this is unnecessary if you throw clear of the victim, over his head, past him about an arm's length.

Fireman's Carry (Continued): Fig. 1. Floating subject. Fig. 2. Ducking under subject's arm to place her over right shoulder. Fig. 3. The carry.

In this way you do not injure him and, with a quick jerk on the line, he has the buoy.

Practice throwing a foot or two beyond or to the side of an object until you can accurately reach your mark. You should be able to throw a distance of fifty to sixty feet.

Towing a Subject: It is a popular belief that when one is being rescued by a life-ring the victim should place the buoy over his head. This, however, is wrong. The hole in the center of the buoy is for the purpose of making it lighter, easier to throw and to hold on to. Never put your head into it, never sit on it.

When waiting to be picked up by a boat, the proper way is to have the buoy float flat on the surface of the water, while resting your hands on the opposite sides of it, thus preventing the buoy from capsizing and slipping away from you. Your head will be well clear of the water as you are in a standing position.

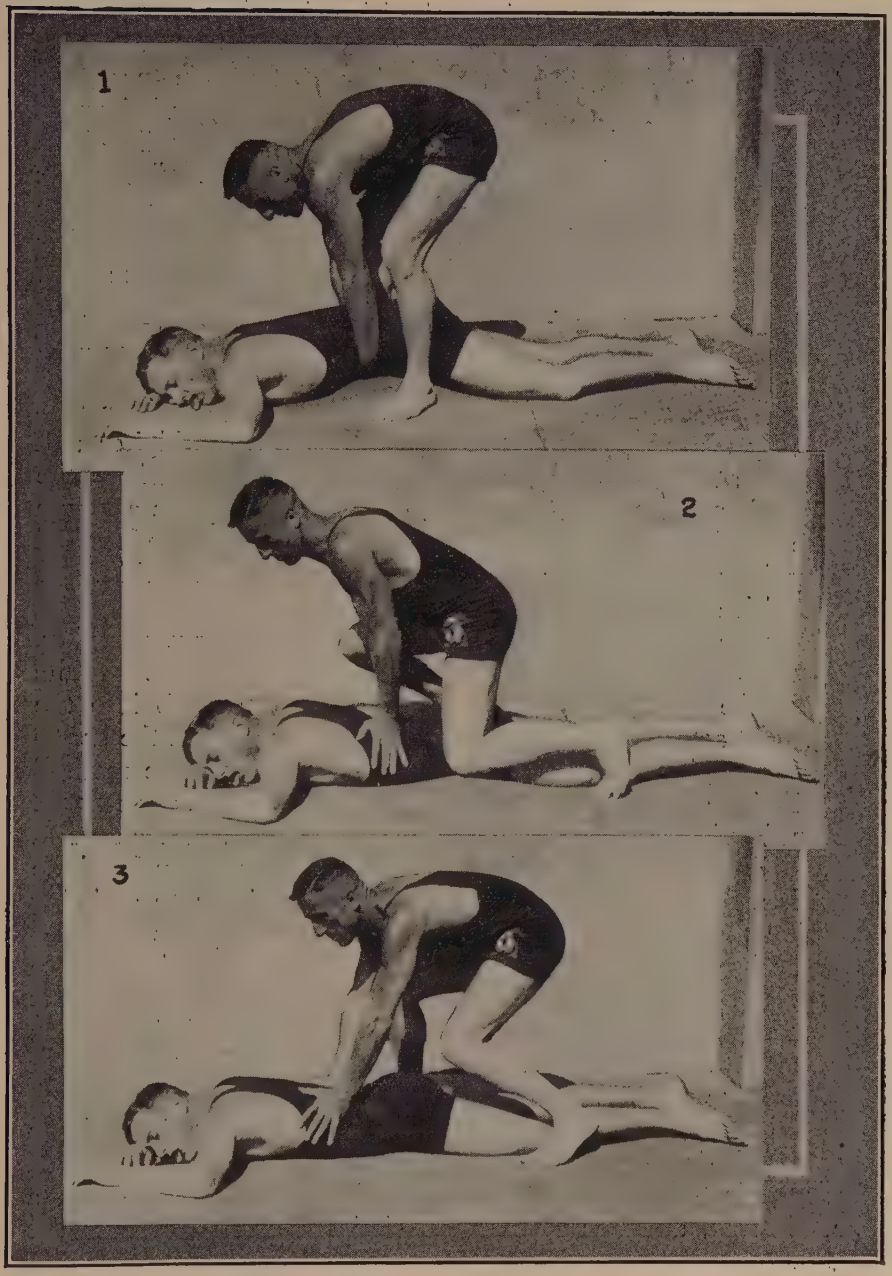
When you are to be hauled ashore, the proper way is to bring the buoy to your chest with one edge of it just under the chin, lie in a prone position, as in the breast stroke. Be sure that the line leads away from you, that it has not wound around your body or your legs. Then signal the rescuers by raising your arm three times. They will "haul away" on the line, pulling you to safety. Should you slip off the buoy, immediately signal by raising your arm once.

(12) Boat Handling and Rescue

If a boat is available, take this test or its equivalent. All prospective camp counsellors, life-guards and swimming instructors should pass the boat and canoe tests.

Many lives are lost annually through ignorance in handling a boat. If the following suggestions are strictly followed, with constant training you will be able to meet most of the ordinary emergencies. Experience is the best teacher. The mere memorizing of these few paragraphs is of no value without being put into actual practice.

Boat Rescue Unassisted: When accidents take place and the rescuer is in a boat or canoe, go to a position where the victim was last seen. (Every boat should have at least 30 feet of rope secured to its bow, which is used as a painter.) Take



Prone-Pressure Method of Resuscitation: Fig. 1. Preliminary treatment. Fig. 2. The pressure, one and two and three and ——. Fig. 3. The release, one and two and ——.

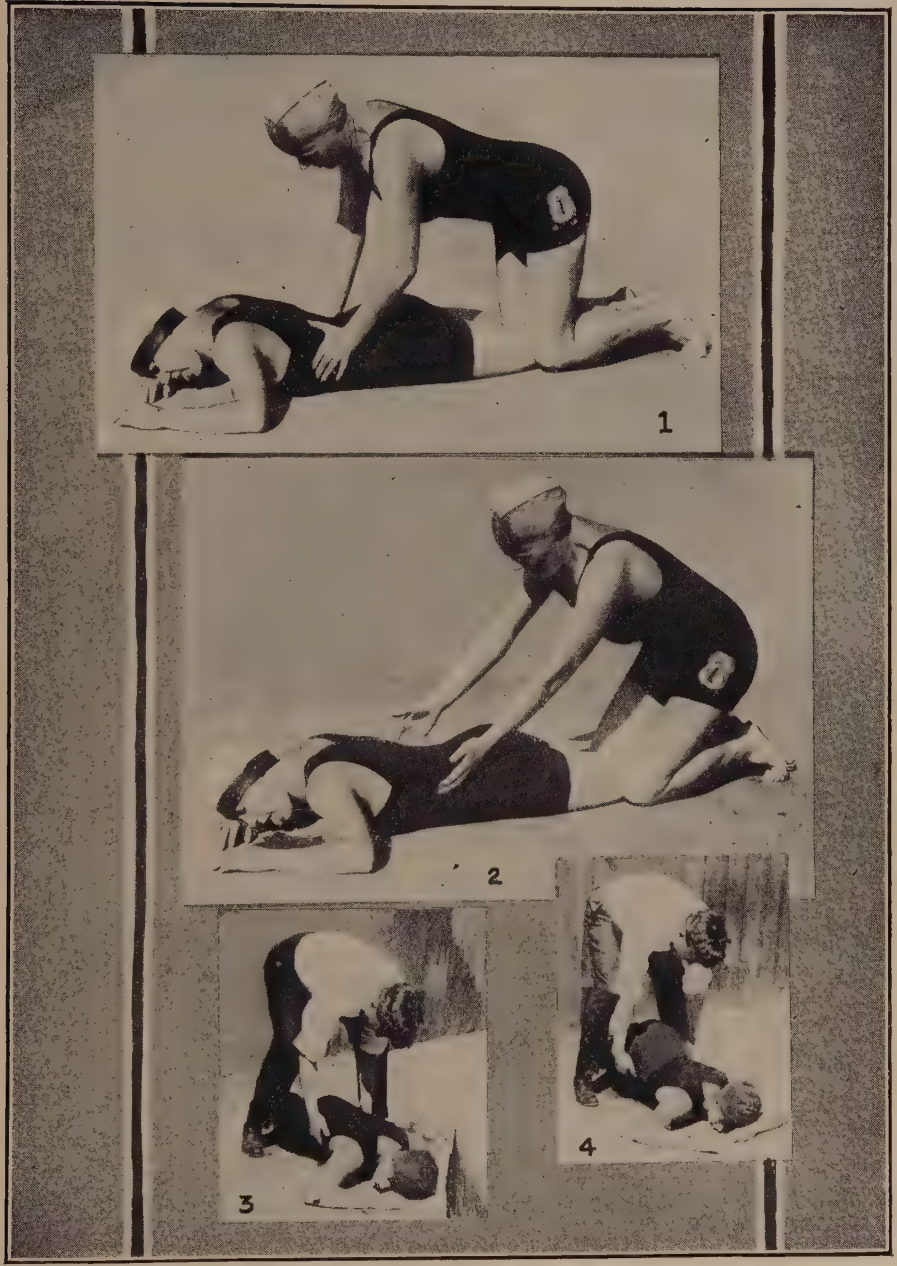
the painter and make fast its end with a bowline around your waist, then jump from the boat, going under the water to a point where you think the victim would be. If the tide or current is setting down, allow for it going below where the victim was last seen. As you are secured to your boat with a line it is impossible for the boat to drift away from you. It is foolhardy to anchor your boat and swim perhaps two hundred yards or so away from it only to find that the tide or current is tiring you out, thereby preventing you from reaching your boat again. Whereas, with a line tied about you (with a bowline to prevent tightening) your boat would be only fifteen or twenty feet away, a little pull on the painter would bring it alongside.

Lifting Subject Into the Boat: Never attempt to take a person in by the bow or stern of a dory (or a boat higher and narrower at its ends). The best place is amidship, where the gunwale is near the surface of the water. Never make a rescue on the weather (windy) side of the boat, always use the leeward (away from the wind) side, it gives you smoother conditions to work with and protects the victim.

Remove the rowlock on the side which you are working, slide the oars well over to the side out of your way. While holding the victim's near hand on the gunwale climb into the boat. Get astride the thwart, place your knees against the boat's side, which gives you balancing power. Use the same method as in lifting a person out of a pool (see Figs. 1 to 3, page 199). Grasp the victim's wrist, turn his back toward you. With several up and down motions, roll the boat, and when the gunwale of the boat is a few inches from the water lift the victim to a sitting position over the side onto the thwart. The subject's feet will now be hanging in the water. Change from the wrist grip to an under the arm position. Step back a pace or so sliding the victim along the thwart, as you do this the boat will right itself, returning to an even keel. The motion of the boat will assist you in each move if you are properly balanced.

This method of hauling a person on board applies only to boats with double ends, and does not apply to a broad-sterned boat. Most flat- and round-bottomed boats and skiffs have a broad stern, and in this case the victim is hauled in over the stern.

In hauling a person over the stern you do not get astride a thwart, but just face aft, either standing against the stern or



Variations of Prone-Pressure Method of Resuscitation: Fig. 1. Modified Schäfer method, pressure. Fig. 2. Release. Fig. 3. Dr. Homer H. Sheffield illustrating his method of resuscitation, pressure. Fig. 4. Release and elevating the hips to facilitate respiration.

kneeling upon the seat while turning the victim's back to you; then you proceed with the same method. It is much easier to take a person in over the stern, and there is less chance of capsizing. Some boats are so constructed that it is possible to use both side and stern for rescue work. However, this can be done with a square-stern, round-bottomed boat or a square-stern dory.

In most boat rescues the victim can be taken to safety, to shore side, before applying first aid. However, should the unconscious person not be breathing begin resuscitation in the boat.

Boat Rescue by Two or More Persons: Should there be two persons making the rescue, let one remain forward with the oars out while steadying the boat against wind, tide, etc., also acting as a counterweight in balancing the boat. Should there be three persons making the rescue, let one remain forward as mentioned, the other person should assist in hauling in the victim. In this case, with two assisting in bringing the subject into the boat do not get astride the thwart, but one should stand against the fore part of the thwart and the other brace against the after part of the same thwart, knees against the boat's side. Proceed as for one person. While making a rescue with more than three in a boat, let the remainder act as counterweights, keeping the boat well balanced, thereby preventing capsizing.

(13) The Canoe Tests

(a) Demonstrate your ability to paddle, bow and stern, handle your canoe under ordinary conditions, and make a correct landing. (If boats are available, pass a rowing, landing and emergency test.)

(b) When tipped out of a canoe, right it and climb in with the aid of the assistant.

(c) While attired in bathing-suit and acting as the bow paddler, the instructor tips you out of the canoe unexpectedly. Regain the surface, swim four hundred and forty yards to a landing, using any stroke, floating and treading when necessary.

(d) While attired in clothes, have instructor unexpectedly tip you out, aid him in righting the canoe, undress, place your clothes in the canoe, swim one hundred and fifty yards to landing, resting when necessary.

8. RELEASE AND RESCUE TESTS

One unexpectedly may be grasped by the wrists, neck or body when approaching a subject or in an accident. Therefore it is imperative to know how to release yourself from any of the grips.

Practice Various Breaks and Carries as Follows:

(1) Correct analysis and application of the breaks and carries on land or standing in shallow water.

(2) Perform each break twice, showing the correct technique. Then follow it with the proper turn and carry. The third time, dive in, swim several yards, demonstrate the correct approach, break, turn and follow with a carry for twenty-five yards.

Combine the particular carry with the break which is best adapted to you and proves to be the most practical. For distance rescues, or when carrying a struggling person, use the hair or rear carry. It is superior because it is the least tiring, affords you more freedom for your stroke and you have better control of a struggling person.

(3) Practice the prone-pressure method of resuscitation for five minutes.

(4) The approach, release and rescue made realistic. Dive in, swim to the subject, attempt to approach him from the rear (see Fig. 1, page 175). If he tries to grasp you, tread, with the knees flexed and legs in readiness to extend, thus pushing the subject away (see Fig. 2, page 175). Gradually work to the rear, then, when he becomes nearly exhausted, use a rear approach and carry.

If the subject resumes struggling during the carry, take a firmer hold and duck him, or let go, remaining a few feet to the rear of him until struggling subsides. Then get him by the hair or bathing-suit and continue carrying to the side of the pool, or to the landing (see Figs. 1 and 2, page 191). Lift him out (see Figs. 1 to 3, page 199) and practice prone-pressure method of resuscitation for three minutes (see Figs. 1 to 3, page 205; Figs. 1 to 4, page 207).

Schäfer Method of Resuscitation

Quickly place the subject in a prone position when taken from the water, then practice the prone-pressure method of resuscitation (Schäfer and Sheffield) for five minutes (see Figs. 1 to 4, page 207).

9. CAMP AND OPEN-WATER SAFETY MEASURES

The Selection of the Bathing-Place

In selecting a suitable place for swimming, whether it be for camps or general use, make sure that you have a sufficient range of depth to accommodate the beginners as well as the more proficient. The beginners' area should extend from the shore to a depth of about four feet. The swimmers' section, from four feet to about ten feet.

Investigate the condition of the water and have it tested for its purity. If possible, select an attractive place, well protected, clean and with a sandy beach.

"Silent Sentinels"

The "silent sentinels" comprise the necessary equipment needed to protect the swimmers, such as ropes, floats, buoys and boats. This equipment should be in readiness for duty twenty-four hours a day.

The beginners' area should be plainly marked off with cork-supported rope, floats or fenced in.

The swimmers' section should be marked off with floats, buoys or by temporarily stationed life-boats.

Regulation life-buoys should be placed along the waterfront as well as on the floats or docks.

Life-boats should always be in readiness for service, free from all obstruction, at all times. The life-boat should not be taken from its location without informing the person in charge, so that a relief boat may be temporarily stationed in its place. This, of course, does not apply to emergency cases. During the swimming period at least one boat should be stationed out by the swimmers' section. If possible, several should be in action, this, however, will depend upon the size of the camp.

Grapnels are a necessary part of the equipment. They are used in dragging for bodies.

"Active Sentinels"

A trained staff of swimming instructors and life-guards is most essential. The swimming coaches must be expert swimmers as well as life-savers and should be schooled in the theory and best methods of teaching. They should stress making every swimmer his own life-saver! The life-guards should be experts and have years of practical experience and rescue work to their credit. They must also demonstrate the ability to handle a boat, throw a life-buoy, tie knots, as well as have a knowledge of first aid.

The number of life-guards, instructors, hours of service and their places of duty will depend upon the size of the camp, its organization and equipment.

Means of Safeguarding Swimmers

Every swimmer should be his own life-saver. Have him demonstrate his ability by passing deep-water emergency tests (page 23) and canoe tests (page 208).

As a protective measure for bathers, it is most important to classify the groups as beginners, intermediates and advanced students.

Designate the groups by different colored caps, bands or suits. To illustrate: beginners, red caps; intermediates, white caps, and advanced, blue caps.

The members of each group should work as partners, and each one must be made responsible for another's safety and attendance. This couple formation also stimulates the competitive spirit and adds to the enjoyment of the period. However, those in charge are *really responsible* for the swimmers' safety. They should call the roll at the beginning, during and at the close of each period, to make sure that every one is accounted for, as well as use water safety measures.

The advanced students should not be permitted to take distance swims unless accompanied by a boat and guard.

The swimming classes should be held at a scheduled time. No swimmer should be allowed to bathe except during this period, when amply protected.

Bathers should not be allowed to swim for at least two hours after meals, otherwise they might suffer from stomach cramps.

10. LIFE-SAVING EQUIPMENT

Life-Buoys

Life-rings should be kept well painted, lettered and free from unnecessary exposure and submersion, so as to prevent water-logging. Only those designated should be used for practice purposes. Others intended solely for life saving should have seventy-five feet of one-fourth inch line attached, one end being spliced around the buoy, the line coiled to the right, which is known as clockwise. The line must be secured in three or four places around the buoy with a light breakable string or thread. This keeps the line free from fouling and always ready for a clear heave (see Fig. 1, page 171). Under no circumstances should the ring be used for seats, fenders, moorings, markers or the like.

The seventeen-inch life-ring is best suited for general all-round work. It does not weigh more than eight or nine pounds and can be thrown with accuracy about fifty feet. Experts reach the mark with ease on a seventy-five-foot throw. This type buoy will support two persons. It is not advised to attach more than seventy-five feet of rope. First, the average person cannot throw the buoy more than fifty or sixty feet; second, the additional line only kinks and prevents the buoy from going any great distance.

All life-buoys should be made from block cork. Ground or granulated cork and kapoc are inferior to block cork. While they can be used, they water-log quickly and will not stand rough usage.

Large ring-buoys of nineteen inches in size are better suited for bridges, piers, steamships and places where the inclemency of weather is greater. They are heavy and cannot be thrown any great distance with accuracy. They are best used for dropping, as in a bridge accident, to support three or four in a swift current. Or from ships' sides, where heavy seas are running and where the undertow and suction are strong.

Life-Boats

When oars and runways are used, they must be kept properly oiled.

Every life-boat should have painted on each side of the bow, in plain, clear letters, the word "Life-Boat," and on each thwart

Life-Saving Equipment: Fig. 1. Life-saving boat in action. Fig. 2. Surf dory. Fig. 3. Skiff.

should be painted, readable from aft, the number of persons, or capacity, as "8 persons" (see Figs. 2 and 3, page 213).

The life-boat should be cleaned and looked over at least once a week while in active service. Once a year every life-boat should have a complete overhauling, scraping, sandpapering, repainting, general repairs made and equipment replaced.

Every life-boat at all times should have not less than three oars and a rowlock attached to the boat for each and every rowlock socket. In addition, a rowlock and socket in the stern as well as a properly cut groove which would be suitable for steering or sculling the boat.

The oars should be laid on the thwarts, blades forward, on each side of the boat, thus allowing for space in the middle of the boat to step in and walk. A person should never step on the edge or sides of a boat, as it may capsize, always use the center.

When not in use boats should be well secured to a dock or landing by means of the painter, using a bowline. Or haul the boat well up on the beach, with the bow always headed out, ready for a quick launching.

It is dangerous to stand up or change seats unless you are an expert boatman. Every year many lives are lost because of the "fool that rolls the boat."

Method of Testing the Cubic Capacity of Open Boats

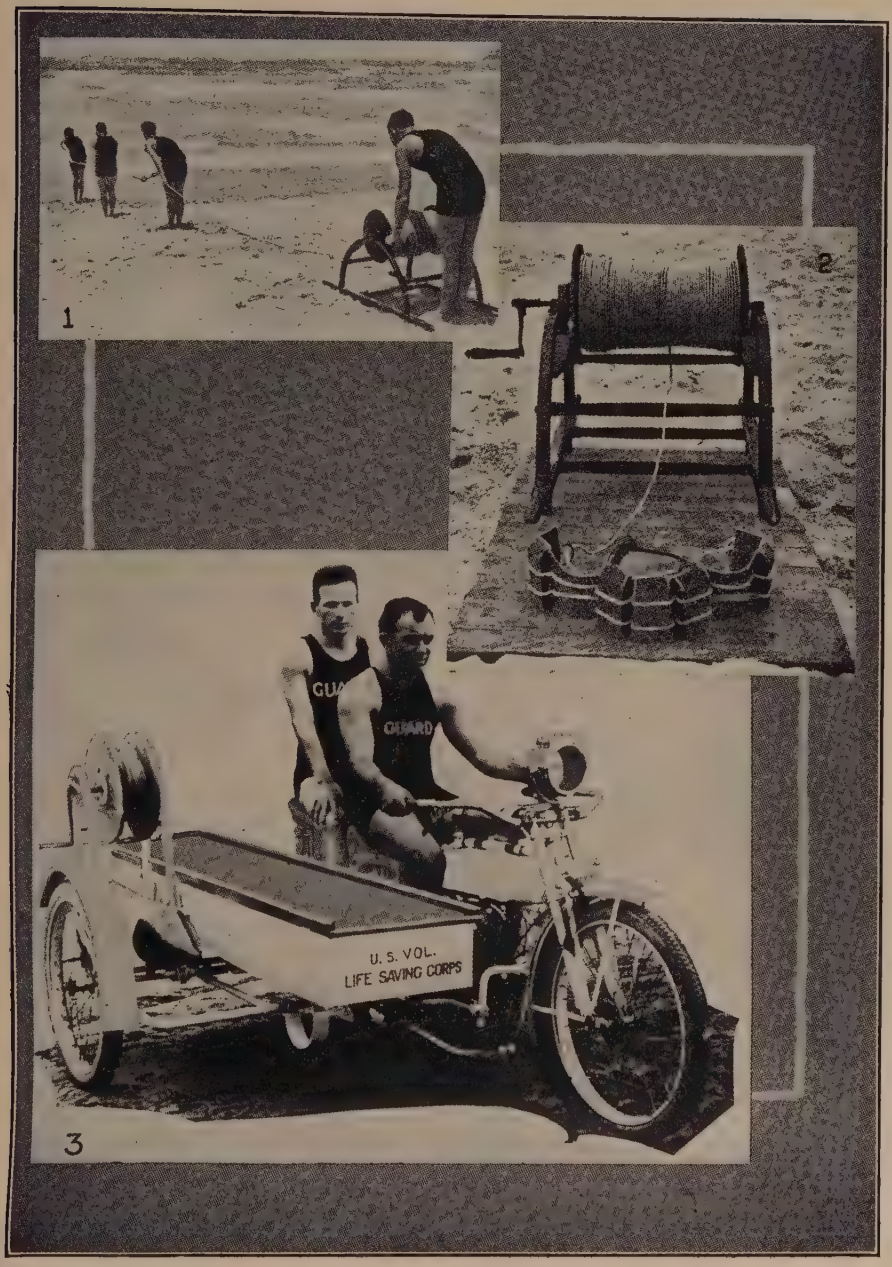
The cubic capacity of an open boat may be determined by Stirling's (Simpson's) rule. The capacity of a square-sterned boat may be calculated as if the boat had a pointed stern.

The following rule may be used: Measure the length and breadth outside of the planking or plating, and the depth inside at the place of minimum depth. The depth used in calculating shall not in any case exceed 45 per cent of the breadth. The product of these dimensions multiplied by the coefficient 0.6 resulting in the nearest whole number shall be deemed the capacity in cubic feet.

To determine the number of persons a boat may carry, divide the result by 10.

Example: The carrying capacity of a boat 17 feet in length, 3.5 feet in breadth and 3 feet in depth will be determined as follows:

$$\frac{17 \times 3.5 \times 3 \times 0.6}{10} = \frac{107.10}{10} = 10.7 \text{ persons}$$



Life-Saving Equipment (Continued): Fig. 1. Australian surf life-saving reel in action. Fig. 2. Surf life-saving reel ready for emergency. Fig. 3. Motorcycle life-saving apparatus.

The cubic capacity of a motor-boat is obtained by deducting from the gross capacity a volume equal to that occupied by the motor and its accessories.

Grapnels

A useful type of grapnel may be made by suspending several one-foot lines with codfish hooks from a four- to five-foot iron or steel bar.

Use a rope which is three times as long as the depth of the water which is to be dragged. Row the boat back and forth over the place where the subject was last seen. The rescuer sitting in the stern should maintain a firm hold on the rope. When the subject is caught, hold the rope securely until the boat is rowed back just above the grapnel. The subject is then slowly raised to the surface.

When the subject is brought to the surface, lift him into the boat and begin resuscitation at once.

Motorcycle Life-Saving Apparatus

The late George Douglas Freeth, Carnegie medalist, member of the United States Volunteer Life Saving Corps, one of the greatest of life-savers, of leaders and of teachers of swimming, diving, life saving and aquatic sports, contributed a most valuable motor-driven life-saving apparatus. His invention consists of a three-wheeled motorcycle, with a revolving reel containing sixteen hundred feet of cable wire attached to an air-tank, used for rescue purposes, also a six-foot box carrying complete life-saving equipment, the cover of which could be used for resuscitating purposes (see Fig. 3, page 215).

Surf Life-Saving Reel

This standard reel has been used most effectively for surf rescue work. Each reel carries five hundred yards of three-ply or four-ply Manila three-fourths inch line (see Fig. 2, page 215).

(Refer to page 249, Life-Saving Competitions.)

11. RESCUER'S SAFETY-VALVE

Attempting a rescue without a thorough knowledge of life saving is dangerous. It may mean two lives instead of one.

Quickly determine the best method of rescue and act accordingly.

Do not swim to the victim if you can throw him an object for support, or row to him.

If possible always approach the drowning victim from the rear.

Avoid releasing yourself by "knock-out" measures, it may prove fatal. Free yourself by one of the tested release measures.

Maintain hold of your victim immediately after the break if he is calm. If struggling violently, remain a safe distance to the rear.

Do not waste your strength talking to a frantic person, he is irrational and cannot hear you.

Employ the correct carry methods and conserve your strength. The hair or rear carry is the best for all purposes.

Commence resuscitation at once, a few seconds' delay may mean the loss of a life.

Artificial respiration is not necessary if the subject is brought from the water unconscious but breathing; treat for shock.

Apply the necessary supplementary treatment for promoting the circulation, applying heat and giving stimulants when the patient is able to breathe.

Review Questions

1. Does a person rise to the surface three times before drowning?
2. If witnessing a drowning, would you plunge in immediately? If so, why?
3. What procedure would you follow for a pool rescue, short-distance or open-water rescue, surf and ice rescue? Explain in detail.
4. Is it necessary to remove your clothes before attempting a rescue? If so, which ones?
5. How would you throw a life-buoy and tow a person ashore?
6. How would you proceed in case of a boat rescue? Unaided, and with assistance?
7. How would you approach a drowning person? If calm? If violently struggling?
8. How would you safeguard yourself in a front approach? A rear approach?
9. What causes a body to sink?
10. If a person has disappeared, how would you locate the body in running water? Still water? Muddy water?
11. On finding the body, how would you bring it to the surface?

12. Would you attempt a rescue if you did not know anything about release and rescue measures?

13. Describe the various methods of release from the clutch of a drowning person?

14. Is it necessary to submerge when breaking the grip of a drowning person? Why?

15. In an extreme case, would you consider it necessary to use "knock-out" measures to free yourself? Why?

16. Which carry method do you consider the best when effecting a rescue? If the victim is calm? Frantically struggling? In case of a cramp?

17. How would you carry a person from shallow water?

18. How would you lift a person out of deep-water end of a pool? Into a boat?

19. What causes suffocation?

20. How would you treat an unconscious person who is breathing?

21. What is the first thing to do after a drowning person is brought ashore?

22. What preliminary treatment is necessary before starting the resuscitation? Why?

23. A person, apparently drowned, is taken from the water and given over to your charge, how would you proceed?

24. For what conditions is artificial respiration necessary?

25. What are the important points which need to be stressed in the treatment of the apparently drowned?

26. Would you wait until you had taken a patient to a house before starting resuscitation?

27. What obstacles are likely to interfere with the entrance of air and how are they overcome?

28. Is it possible for a drowned person to have water in the lungs?

29. How many complete resuscitation movements should be given a minute?

30. How long would you persist in your efforts to revive a person?

31. How can bystanders assist you while you are resuscitating?

32. Once breathing is restored, what supplementary treatment is necessary? What is to be feared?

33. Why is the prone-pressure method of artificial respiration superior to others?

34. What are the "silent sentinels" and "active sentinels"?

35. What protective measures would you employ for safeguarding a group of non-swimmers and swimmers? In a pool? Camp? Ocean?

36. What equipment do you consider necessary for adequately protecting a camp?

37. How is a life-buoy made ready for a rescue?

38. How is a life-boat made ready for a rescue?

39. What precautions would you take in permitting non-swimmers and swimmers to use the canoes or boats?

40. How would you determine the capacity of a boat?

41. When is it necessary to use grapnels?

CHAPTER X

SWIMMING AND LIFE-SAVING TESTS

Educators, directors of physical education and progressive swimming coaches realize the educational and physical values of swimming and life saving, and advocate that all students pass a swimming test. *The beginner's swimming tests should serve as a minimum requirement for graduation.* It is a swimmer's safety test. The student's goal, however, should be the completion of all tests.

The following tests are arranged to meet the demands of schools, colleges, clubs, recreational centers and camps (minimum grade of 75 per cent., or its equivalent should be made in order to pass the test).

The various tests are listed according to their order of importance and emphasize the logical progression in learning them.

If you want to keep a class record of the scores and tests passed, simply write the students' names in a column down the left-hand side of your record sheet, place the names of the tests across the top of the page and record the scores below each test and the final score on the right-hand side of the page.

The table of tests and scores serves as a means of checking the progression made in swimming, diving and life saving. By recording the individual and class scores interest is stimulated and incentives for greater efforts are aroused.

Interest in swimming and life saving also may be promoted by holding informal monthly swimming meets for beginners, intermediates and advanced students. Post the results of each meet, which is another means of determining the individual progress. It is an incentive for the individual to swim against his own time and attempt to better it. (Refer to page 165 for program suggestions for closed and open meets.)

BEGINNER'S SWIMMING TEST

	Maximum Points	*Points Awarded*
1. Face float, 5 to 15 seconds, then regain standing position	5	
2. Back float, 2 minutes	5	
3. Change body positions, back, face, side	5	
4. Swim preliminary crawl or side stroke in good form 40 to 80 yards	15	
5. Swim sculling or elementary back stroke in good form 20 to 40 yards	10	
6. Tread water, 2 minutes	10	
7. Sink, save self, swim a few strokes, repeat several times	10	
8. Swim, collide, grasp partner, free self, continue swimming 20 yards	15	
9. Plain dive in good form	10	
10. Swimmers' safety test; dive in, swim (300 yards), float and tread without touching a support (20 minutes, time limit)	15	
TOTAL	100	

INTERMEDIATE'S SWIMMING TEST

	Maximum Points	*Points Awarded*
1. Pass the deep-water emergency tests	5	
2. Swim the elementary back or sculling stroke in good form 20-40 yards	5	
3. Swim the side or single overarm side stroke in good form 80 to 100 yards	10	
4. Swim the preliminary crawl or trudgen stroke in good form 80 to 100 yards	15	
5. Plain or racing dive in good form	10	
6. Dive in, swim (440 yards), float and tread without touching a support (20 minutes, time limit)	10	
7. Front neck or body grasp, release, any carry, 20 yards	10	
8. Rear grasp, release, tired swimmer's carry, 20 yards	10	
9. Approximate actual rescue—approach, break (if caught), turn, and carry 20 yards	15	
10. Resuscitation, 3 minutes	10	
TOTAL	100	

ADVANCED SWIMMING TEST

	Maximum Points	*Points Awarded*
1. Swim crawl or trudgen crawl in good form 100 yards	10	
2. Swim racing back stroke in good form 50 yards	10	
3. Swim racing breast stroke in good form 50 yards	10	
4. Racing dive and turn	5	
5. Running front dive (plain or swan)	10	
6. Running front jack-knife dive	10	
7. Back jack-knife dive	10	
8. Back dive	10	
9. Float, tread and swim 440 yards using any stroke (10 minutes, time limit)	10	
10. Approximate actual rescue—approach, break (if caught), turn, and carry 20 yards, resuscitation, 3 minutes	15	
TOTAL	100	

JUNIOR LIFE-SAVING TEST

	Maximum Points	*Points Awarded*
(The requirements for this test consist in passing the Intermediate Swimming Test and being under eighteen years.)		
1. Floating and treading water for 5 minutes	5	
2. Swim 440 yards	5	
3. Surface dive in 7 to 9 feet of water, recover a 10-pound weight	10	
4. Disrobe in deep water, swim 100 yards using side stroke and crawl	10	
5. Demonstrate correct front and rear approaches, followed by a turn and short carry	10	
6. Demonstrate following carries (precede each with a 20-yard swim, execute the correct approach, turn, then carry subject of own weight 20 yards):		
Rear or hair carry	5	
Cross-chest carry	5	
Tired swimmer's carry	5	
7. Demonstrate following breaks (while in deep water perform each break three times against real opposition, follow with proper turn and carry for 10 yards):		
Single wrist grip, two positions	5	
Front neck hold, two positions	5	
Rear strangle hold, two positions	5	
8. Demonstrate fireman's carry from shallow water	5	
9. Demonstrate prone-pressure method of resuscitation, 3 minutes	15	
10. Oral or written examination concerning any part of this test	10	
TOTAL	100	

SENIOR LIFE-SAVING TEST

	Maximum Points	*Points Awarded*
(The requirements for this test consist in passing the swimming tests, the Junior Life-Saving Test and being more than eighteen years. The applicant must pass a physical and medical examination.)		
1. Floating and treading water for 5 minutes.	2	
2. Dive and swim under water 50 feet.....	3	
3. Dive or jump from a 5- or 10-foot platform and swim 440 yards.....	4	
4. Surface dive in 7 to 9 feet of water, recover 10-pound weight, then a subject and swim 20 yards.....	5	
5. Enter deep water fully clothed, undress, swim 100 yards.....	4	
6. Swim 50 yards, clothed, carrying fully attired subject	4	
7. Approach from the front and rear, follow each with turn and carry.....	5	
Breaks (while in deep water free self from the following holds, performing each break three times against real opposition and follow with the proper turn and carry for 10 yards):		
8. Double wrist grip, two positions.....	5	
9. Single wrist grip, two positions.....	5	
10. Any wrist grip.....	5	
11. Front neck hold, two positions.....	5	
12. Front body hold.....	5	
13. Any front hold upon the body.....	5	
14. Rear strangle hold, two positions.....	5	
15. Any rear hold upon the body.....	5	
Carries (execute the following carries, preceding each with a 25-yard swim, demonstrating the correct approach and turn, and continue carrying subject for 50 yards):		
16. Rear or hair carry.....	3	
17. Cross-chest carry.....	3	
18. Head or side carry.....	3	
19. Tired swimmer's carry.....	2	

SENIOR LIFE-SAVING TEST—*Continued*

	Maximum Points	*Points Awarded*
20. Carry two persons locked	3	
21. Demonstrate the proper way of lifting a person from deep water	2	
22. Demonstrate the fireman's carry from shallow water	3	
(The subject must equal own weight for tests 21 and 22)		
23. Demonstrate prone-pressure method of resuscitation, 5 minutes, followed by the proper procedure for promoting the circulation and warmth (be prepared for an oral or written examination explaining the full procedure which takes place from the time the subject is brought ashore until revived)	7	
24. Throw a life-buoy with accuracy for 50 feet and pull in the subject	3	
25. Demonstrate ability to handle a boat and canoe, pass the canoe tests and rescue a subject from a boat unassisted, as well as lift the subject into the boat	4	
TOTAL	100	

CHAPTER XI

WATER SPORTS

Water games and stunts stimulate the individual's interest in swimming and, if properly conducted, may serve as wholesome physical and social recreation. Teaching watermanship by means of play and music is one of the best ways of presenting the subject-matter.

A series of games has been arranged applicable to all ages, progressing from the elementary team games to the advanced sports of water baseball, basket-ball and water polo. In addition to interclass, interscholastic, club and playground competitions in swimming and life saving, contests could be held in any of the elementary team games listed, thereby offering to the majority an opportunity for organized competitive play.

1. INDIVIDUAL STUNTS

Front and Back Somersaults

Attempt the front somersault by quickly ducking the head forward, while scooping the arms backward and upward.

Perform the backward somersault by arching the head and body backward while using short, quick forward and upward scooping arm movements.

Double somersaults are very interesting to the spectators but are rather difficult to perform. Partners stand back to back, one in an upright position, the other in a head-stand position. Then each will close his legs about his partner's head, and start a backward somersault by taking a series of wide, forward arm swings.

Perform a double forward somersault by facing each other, clasp hands, partners will then press their flexed knees against each other, and spin around in this position.

Log-Rolling

While floating extend the body and stretch the arms over the head. Start rolling by quickly turning the head and body to the right (or left). Continue spinning around by means of a rapid and continuous twisting movement of the body.

Monkey Roll

This stunt is performed in shallow water with couples in a line or circle formation. Number ones execute a surface dive, spreading the legs apart, at the same time number twos dive over number ones. Then all turn around under water, stand, face each other and repeat several times, number ones always diving under, twos over.

Porpoise Diving

Execute a surface dive, go to the bottom, spring up to the surface, repeat. Porpoise dive forward, backward or sideward.

Porpoise diving is very effective if performed by teams of three or more in line formation while keeping together. Or start the groups diagonally opposite each other, in file formation; porpoise to the center, weaving in and out.

Riding a Bicycle

While in deep water pretend that you are sitting on a bicycle, with your hands placed on the imaginary handle-bars at the water surface. Then use a pedaling foot movement while slowly progressing forward. Interesting pantomime makes it the more effective.

Sculling Feet First (Hands Over the Head)

Sculling Head First (Hands at the Sides)

Seal (Underwater) Swimming

Garbed in seal costumes (or bathing-suits) stand in shallow water. Swim across the pool by bending and forcibly extending the ankles, while holding the legs together. Employ a sculling hand movement with the arms near the sides of the body. Or place the hands on the back, with the back of the hands together and move them up and down.

Spinning Top

Assume a sitting float, draw the knees up close to the chest, spin around by pushing forward with the right hand and back with the left.

Spiral Swimming

Propel yourself forward by alternating the crawl with the racing back crawl, while revolving the body to the right or left.

Submarine

Swim with one leg raised. Disappear, then come to the surface like a submarine. To sink yourself, employ a sculling arm movement, accentuating the upward drive. To rise to the surface, accentuate the downward movement.

Swimming the Breast Stroke Backward (Crab Swimming)

Perform the movements of the breast stroke slowly, but exert force during the recovery of the stroke, thus sending the body backward.

Tilting

Form in groups of twos, with one player sitting on the shoulders of his teammate. Wrestle and try to upset opponents. The sole survivor wins.

Walking on the Water

Assume a back-floating position, and walk forward by bending the knees and exerting a forceful downward pressure against the water.

2. NOVELTY RACES

Balloon Race

The object of this race is to "nose" the balloon across the pool without touching it with the hands. The contestants start on one side of the pool and swim across, the first one reaching the opposite side wins.

Or competing teams may start from opposite sides of the pool, swim across.

Bookworm Race

Swim across the pool on your back, using the legs alone. While holding a book, turn the pages and read aloud. The contestants must be appropriately garbed, such as an old professor's hat, spectacles, etc. The winner will be determined by the one who gets there first, or who has the best take-off.

Another variation of this race is to swim with an umbrella in one hand and a book in the other (see Fig. 2, page 239).

Candle or Good-Night Race

The participants line up about the deep-water end of the pool, robed in night-dresses and caps. At a signal they dive into the water, swim to the opposite side of the pool where candles and matches have been placed. The swimmers quickly light their candles and swim back, holding them out of the water with both hands. The first swimmer to reach the starting-place with the lighted candle wins (see Fig. 4, page 239).

This race may be varied by having the contestants swim the length of the pool, climb out, dress in old-fashioned nightgowns and caps or pajamas, light their candles and return.

(This novelty race employs the back or side stroke carry used in life saving.)

Egg-and-Spoon Race

The contestants hold on the edge of the pool, place the handle of the spoon between their teeth, then place an egg (or peanut) in the spoon. If the egg drops off the spoon, the competitor has to replace it and continue swimming.

Shuttle Race

Couples line up at one end of the pool. Start the race in a back-floating position, with the first swimmer holding the feet of the second swimmer. Progress is made to the opposite side by the first swimmer pulling himself forward and under the body of the second swimmer. Then the second swimmer grasps the first swimmer's ankles and repeats. They continue over and under across the pool.

Flag Race

This race appeals particularly to children. Line up contestants at one end of the pool and have them swim across,

carrying a flag in one or both hands. The various national flags may be used, thus adding zest to the competition.

Frog Race

This race is especially adapted to children. The contestants should be garbed in green frog costumes. At a given signal they hop to the edge in frog fashion, jump in, swim breast stroke to the opposite side.

Hoop Race

Two or more teams are lined up at the deep-water end of the pool. Large hoops are suspended over the water and placed before each line. When the starting signal is given the leader of each group dives through the hoop and swims to the opposite side (or to a rope stretched across the center of the pool). As each swimmer touches the finish-mark, the next one dives in. The team wins which succeeds in getting all of its members to the finish-line first.

Over-and-Under Race

Line up teams in column formation in shallow water. The game is started by having the end man of each line place his hands on the person's shoulders in front of him and leap-frog over. Then dive under the spread legs of the second one. Continue in this fashion until the end of the line is reached. The team wins which gets its leader back to the starting position first.

Obstacle Race

The swimmers line up and, at a given signal, dive into the water and swim the length of the pool, going over or through the various obstacles placed in the course, such as life-buoys, barrels, hoops, turning somersaults over a rope, etc.

Shadow Swimming

Two swimmers start across the pool at the same time. The one on top swims directly over the other using a breast stroke while the shadow swimmer remains several feet under water using a modified elementary back stroke or a breast stroke.

Swimming Under the Arches

Two or more teams line up in column formation. Each competitor places his feet in a stride position and his hands on

the shoulders of the one in front of him. When the starting signal is given the leaders face their lines, dive and swim under this archway. When they reach the end of their lines they stand. Then the second player in each line repeats this procedure. The race continues until all have had a turn. The team wins which gets its leader back to the starting position first.

Swimming With Arms Alone

Swim in a prone or back position with the arms alone while holding a floating object between the knees. If the contestant loses the object during the race he is disqualified.

Swimming With Hands and Feet Tied

Contestants line up at one end of the pool with their hands bound to their bodies and their ankles tied. Upon the starting signal, they jump in feet first, and swim across the pool. (Be sure to have some one ready to catch each contestant as he finishes.)

Surf-Board Race

Mount the board, race across the pool using arms alone, legs alone or both.

Tandem Races

Tandem races add variety to the swimming program. The teams line up and swim, using the crawl, back crawl (or a combination of these two strokes), breast, sculling or elementary back strokes. Line up in twos; the one leading placing his feet about the waistline of his partner.

Three-Legged Race

Partners stand together on the take-off, with their inside legs bound together. On a given signal they dive in, swim to the opposite side and return. The pair finishing first, with their bindings secure, wins.

Two-Face Race

The contestants place grotesque or comic masks on the back of their heads. Then line up by grasping the railing and push off feet first in a prone position. Swim across the pool with the feet leading, using a back sculling-stroke arm movement.

The course of the race should be such that seated spectators view masked head only, otherwise the illusion and fun are lost.

Tub Race

Contestants hold on to the edge of the pool and assume a sitting position in the tub. At a signal, they propel themselves forward by a paddling or scooping arm movement. If a swimmer tips over he must right himself and continue paddling to the finish.

Umbrella Race

The contestants, possessing open umbrellas, line up in the deep-water end of the pool. At a signal (whistle, or, to add a little spice, start them by suddenly turning the hose on them), the swimmers push away to the opposite side, using the side stroke, and carry the umbrellas above the water.

(This novelty race is of value because it employs the side carry used in life saving.)

Varsity Crew Race

This effective race resembles college crews. Have several teams lined up, representing different schools or colleges and garbed in their characteristic colors or insignia. Line up in groups of four or more with the feet of each contestant gripping the waist of the one in front of him. Swim the length of the pool using the elementary back stroke. The first swimmer should act as a coxswain, calling out: "Up, Out, *Pull*!" The crew reaching the finish-line first, without breaking, wins.

Water-Bug Race

The participants should be dressed in striped costumes (or place colored stripes over their suits). This gives the effect of a water-bug's body. Push off face submerged. Swim across the pool using a crawl kick and a modified sculling-stroke arm movement. Bring the hands up along the sides of the body, elbows protruding, then push down toward the feet. Breathe when necessary, but keep the face submerged as long as possible. The effect of the elbows sticking out of the water and the body humping resembles a water-bug crawling on the water.

3. RELAYS

Ball Relay

Two or more teams of four line up with two of their members at the starting-mark and the other two standing on the other side of the pool facing them. The first member of each team dives in with a rubber ball (or balloon), swims to the opposite side without touching it with his hands. Upon reaching the opposite side, he climbs out and gives the ball to the next swimmer. The game continues until all have had a turn.

Chain Relay

Teams of four or more players line up in shallow water. Each member joins his hands about the waist of the one in front of him. The teams race to the opposite side and back to their starting-places without breaking the chain. If any one breaks the chain his team is disqualified.

Pick-Up Relay

Two or more teams are lined up at the deep-water end of the pool. Four objects are placed on the bottom of the pool, directly in front of each team. At a signal the leaders dive in, recover the objects by means of a series of surface dives and bring them back to the starting-place. Then touch off the second swimmer who replaces them. The game continues in this manner until all have had a turn.

Passing Relay

Two or more teams line up in shallow water facing their goals. When the signal to start the game is given the leader of each line passes the ball overhead to his teammate in back of him. The ball is passed on down the line until all have touched it. Then the end player gets the ball, and runs forward to his goal line, returns to the front of his line and passes the ball backward. The game continues until all players have repeated the performance of their leaders. The team wins which has its leader back in the starting-place first.

(Any number of variations of the passing relays might be used: a ball or object could be passed under the water between the spread legs of the players, over and under, or sideward. Then the players could swim, run, skip, hop, jump, walk, etc., with the objects.)

Seal-Stroke or Dog-Paddle Relay for Children

For this relay the participants are divided into four equal groups. Groups A and C are lined up on one side of the pool, groups B and D are lined up on the opposite side. Groups A and B comprise one team, competing against groups C and D. At a signal the first contestants of group A and C enter the water, swim (or run) to the opposite side of the pool. Upon touching the side, leaders of groups B and D enter the water and swim to groups A and C. When a contestant touches the opposite side, he should climb out and go to the end of the line. The swimming continues until all contestants of groups A and C have changed places with those of groups B and D. The two groups or teams win which first complete the exchange of places. Any number of groups may be formed, depending upon the number of players.

Simple Relay

The simple relay is the same as the preceding one except that speed strokes are substituted for the seal stroke or dog paddle.

Touch-and-Turn Relay

For this relay the contestants are formed in four or more equal groups lined up on one side of the pool. At a signal the number ones of groups A, B, C and D enter the water, walk, run, skip, hop, jump or swim to the opposite side and return. As soon as the number one of each group touches the side of the pool, number two dives into the water. Number one then jumps out and goes to the end of the line. The team wins whose last contestant touches the starting-place first.

Variation Relays

Form in teams ready for the relay race. Combine variations of stunts, obstacle racing, leap-frog, disrobing, etc.

4. GAMES

Ball Tag

Swimmers may play in either the shallow or deep-water end of the pool. The one who is "it" starts the game by throwing the ball, attempting to hit one of the players.

The player who is hit by the ball becomes "it." Players may walk, swim or dive in the water to avoid being hit.

Bell Tag

This game is played in the shallow or deep-water end. The players are blindfolded and try to catch the one who has the bell. He is not blindfolded and must ring the bell often to help the other swimmers to find him.

Call Ball

Players form in one or more circles with one member standing in the center. The center player calls the name of a player while he throws the ball into the air. The individual whose name is called must catch the ball before it touches the water, otherwise he takes the center player's place and the game continues.

Challenges

Challenges made between individuals within a group or leaders of different groups are always good fun. The challenger performs the stunt. If the opponents cannot do it a point is scored for the challenger.

Circle Catch

Players join hands in two or more circles of even numbers. A leader or captain is appointed for each group. Upon a signal each leader passes the ball to the left (or right). The object of the game is to see which side can pass the ball around the circle one or more times and get it in the leader's hands first. If a contestant misses the ball he must recover it as quickly as possible. (In place of a ball a heavy object may be used. If a player misses it he must dive after it.)

Circle Tag

Form in a double circle, facing in line of direction, with inside hands joined, the one who is "it" to stand in the center. When the leader gives a signal (or whistle) the class walks, skips, runs, etc., following the instructions called for. When a second whistle is sounded all must change places while the one who is "it" tries to get a partner. The game continues in this manner, the instructor calling for various stunts, stopping

them at long or short intervals, depending on the interest of the group. This game may be used as a social mixer.

Cork Game

The teams are lined up on opposite sides of the pool. Throw several hundred small corks in the water. At a signal the teams swim toward the center and attempt to get as many of the corks as possible. The team wins which collects the greatest number in a given time.

Cross Tag

The one who is "it" starts the game by naming a player, then swims after him until he is tagged or until some other player swims between the person who is "it" and the one who is being chased. When this occurs, the one who is "it" must pursue the one who crossed between them. If the one pursued is caught before another player recrosses his path he becomes "it," and the game continues.

Diving for Objects

Have contestants dive into shallow or deep-water end for plates and spoons, pennies or other objects. Place the spoon on the plate and swim to the opposite side.

Duck Chase

Place one or two ducks in the pool about ten yards from the line-up. At a given signal swimmers dive in and attempt to catch the ducks (see Fig. 5, page 239).

Flying Fish

The team is lined up on one side of the pool, sitting on the edge, assuming a diving position, or some comical pose. When the leader calls "Go," the team dives in and swims to the opposite side, climbs out and assumes the starting position. The last member of the team to get into position must drop out of the game. The game continues with its rapid elimination until but one player remains.

Follow the Leader

The players choose a leader who performs a series of stunts. The rest of the players must imitate the leader. When one of the players fails to perform the stunt given he must drop out.

The game continues until the leader has executed all of his stunts, then a new leader is chosen.

Fox and Ducks

Choose one (or more players) to be the fox, one (or several) to be the mother duck. The other players are little ducks which form in a line (or lines) behind the mother duck, each one holding the waist of the one in front of him. The fox attempts to catch the last duck. The line led by the mother duck turns in various ways to protect the last little duck from being caught by the fox. When the last duck is tagged, he becomes fox and the former fox becomes the mother duck. This game may be played in deep water as well as in shallow water.

Hold Tag

This game may be played in either the shallow or deep-water end of the pool. The one who is "it" walks or swims after the players, attempting to tag them. The player tagged must place his left hand on the spot where he was touched and, holding this position, attempt to tag some one else.

Neptune's Call

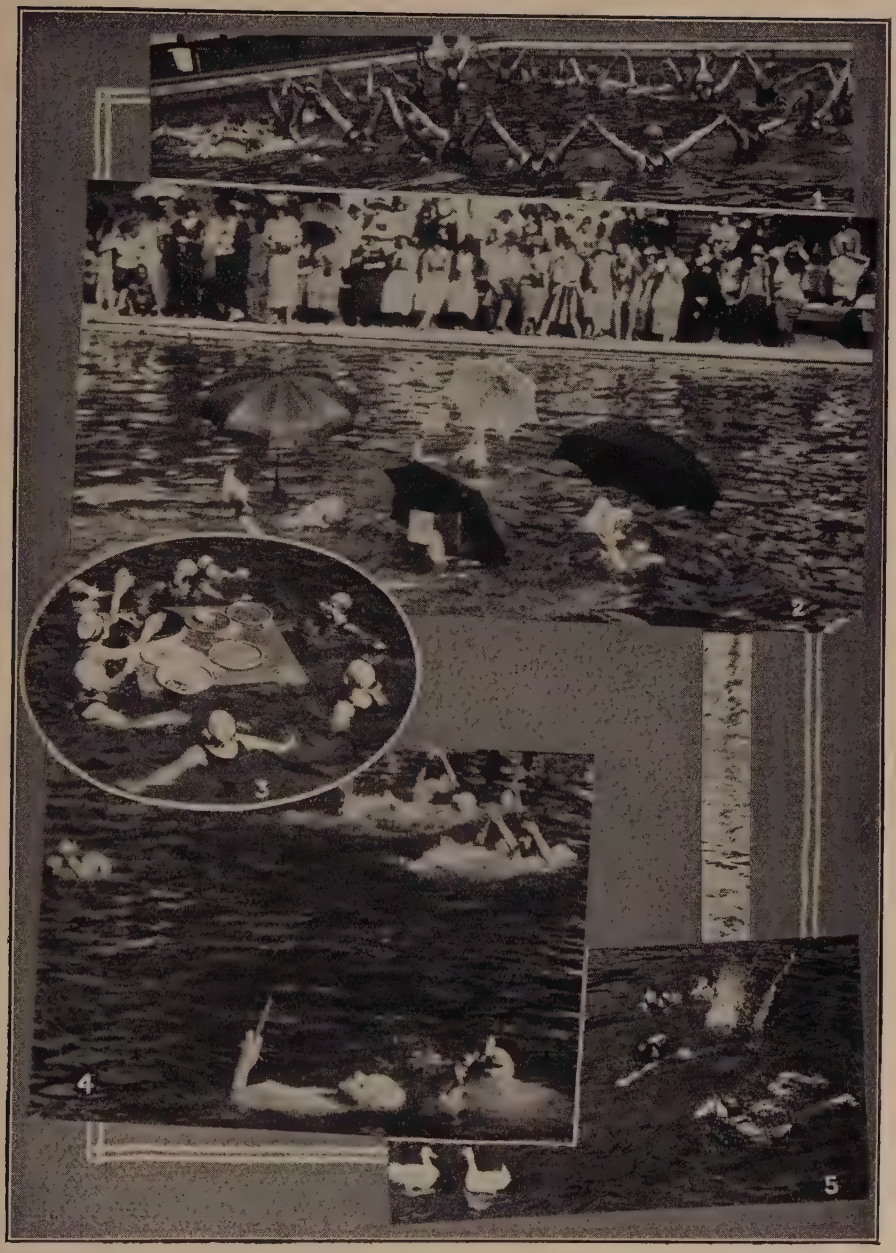
This game may be played in deep or shallow water. Line up the players on one or both sides. The one who is "it" stands or treads water in the center of the tank. When he shouts "Neptune's call, come one and all!" the players must swim to the opposite side, and he tries to tag as many as he can. All of the players that are tagged must remain in the center and assist in capturing the others until all are caught. The player who was caught first is "it" for the next game.

Partner Tag

Form in groups of twos. One of the couples is appointed "it." The object of the game is to tag some one else, without letting go hands. If a couple "breaks" to avoid being caught they are automatically made "it." Or if one of the partners is tagged, that couple is "it," and the game continues.

Porpoise Tag

This game is to be played in shallow or deep water. Appoint one or two players "it." To avoid being caught swim



Water Sports: Fig. 1. Diving through the arches. Fig. 2. Umbrella race. Fig. 3. Mermaids' tea party. Fig. 4. Candle race. Fig 5. Duck chase.

under the water, porpoise dive or push off from the sides of the pool. Walking or surface swimming disqualifies you.

Take Away

The swimmers choose sides and may play in shallow or deep water. The object of the game is for one side to take the ball away from the other.

Third Frog in the Puddle

Players form in a double circle, couples facing each other in the shallow end of the pool. Then choose one of the players to be "it," and one to be chased. The one that is to be chased may walk or swim around or between the players, and is free from being tagged when he stands between the two players of any couple, and the one who is "it" must attempt to tag the one toward whom the chased player turns his back. The one who is tagged becomes "it," and should tag the one who caught him, if possible. Short and quick changes are necessary to make the game exciting.

Trick Tag

This game may be played in shallow or deep water. Start the game by having the participants scattered about the pool. The one who is appointed "it" calls for different parts of the body to be lifted out of the water, such as the feet or arms, or he may vary this by quickly calling for different floating positions or stunts. Any one who fails to perform the trick is subject to being caught. Or the game may be played by having those who fail drop out.

Touch

Teams line up on opposite sides of the pool. The object of the game is to touch whatever is called and to return to starting-place as quickly as possible. The team having all of its players back first scores a point. The leader or instructor may bring in any number of skills learned, and the game can be made most interesting as he calls out "touch bottom of the pool" or "touch your opponent's toes," "red," "suits," "rubber," "wood," etc.

Tug of War

Have two teams facing each other while standing in shallow water. The anchor, or end, man of each line sits on the edge of the pool and holds the end of the rope. The object of the game is to pull the opponents' end man off the edge.

Swordfish and Minnow

Join hands in circle formation. Two players are chosen "it." One to act as the swordfish, the other the minnow. The players raise and lower their arms to protect the minnow from the swordfish and, if possible, prevent it being caught.

Dodge Ball

The players choose sides. Group one forms a large circle around group two in the shallow end of the pool. The outside circle has one or two volley or water-polo balls with which they attempt to hit the players. The players within the circle may walk, swim or duck under the water to avoid being hit. As soon as a player is hit with the ball he must join the circle and assist in hitting the remaining players. When all have been hit the groups change places and repeat. The last two players who were hit in each game are captains to choose the players for the next contest.

Bat Ball

This game may be played in shallow or deep water. Mark a home base at one end of the pool and mark a second base about forty feet away. The players form in two equal teams, one at bat behind the home-base line and the others covering the field as completely as possible. A volley or water-polo ball is used. The batter tosses the ball up and bats it with his fist. When a fair ball is hit (that is, in the playing-space) in front of the home-base line, the batter must swim to the second base and return to the home-base line. Fielders try to put the runner out by hitting him with the ball or catching a fly ball; they must not swim with the ball but pass it to other fielders who are near the runner. When a fielder swims with the ball the opposing side is awarded a point. A point is also made after the runner touches second base and returns to home base without being hit. Runners are permitted to duck under the water to avoid being

hit. Fielders and batters change places when three outs are made.

Over the Top

This game should be played in the shallow end of the pool and in a space with definite boundaries. Stretch a rope (or net) across the playing-space, about four feet above the water. Two captains choose their teams of equal numbers. The teams line up, one at each side of the rope (or net). The object of the game is to throw a ball over the rope (or net) so it will strike the water in the opponents' half of the court. The opponents try to catch the ball before it touches the water and throw it back. If the ball hits the water in the opponents' territory it is a score for the side throwing it. A foul ball is one that hits the rope (or net), goes under the rope, or is thrown outside of the opponents' court in any direction without the opponents touching it. A foul scores a point for the other side. The team having the largest score at the end of the playing-time wins the game. Over the top or volley-ball may also be played in deep water with the rope (or net) four feet above the water surface.

Water Baseball

Mark out a small baseball diamond in the shallow or deep-water end of the pool or use stationary floats for bases. The game is then played according to indoor baseball rules, except that a water-polo, volley or tennis ball is used, and the batter hits the ball with his fist.

Water Basket-Ball

This game should be played in the shallow end of the pool and according to the official basket-ball rules.

Water Polo

This game is one of the most exciting and difficult of the team games. For particulars refer to the Official Water-Polo Rules.

5. FEATURE AND COMIC STUNTS

Butterfly Floating

Form in groups of twos, assume a back-floating position with the head of one at the feet of the other. Grasp each other's

inner leg with your inner hand. Then imitate the opening and closing of the butterfly's wings by spreading and closing your arms and legs.

Fasten a triangular strip of gayly colored cloth from the shoulder-strap to the hip and hand to serve as wings. The front of the suit is covered with similar material. Stripes or circles may be sewed on the wings and body which will add to the effectiveness.

Formation Floating

Train the groups to form letters or other fancy formations, with or without balloons.

Formation Swimming

Swim in "V" formation in teams of five or more. Assume a prone position with the body arched, head up. Employ a sculling arm movement with the hands at the sides, and use a crawl kick. Different strokes and varied formations may be used while swimming to music or while swimming under water with flashlights.

Wheel Floating

A group of eight swimmers form in a circle with four facing in toward the center and four facing out. The tallest ones should place their heads in the center, thus forming the hub, spread the legs. Then grasp the closed ankles of the four outer ones. The outer group, or those forming the rim, extend their arms sideward and grasp the others' ankles.

Revolving Wheel

While in a floating-wheel formation have two additional swimmers revolve the wheel by attaching long streamers to two of the outer members, then start swimming around. The school colors may be represented by colored caps, suit colorings, balloons, flags, etc.

Evolution of the Bathing-Suit

Boys or girls march by while showing the evolution of the bathing-suit, and the stroke used for each period. Good pantomime and clever costumes add to the humor of this stunt.

The Fisherman

While other events are being run off, or between them, it is amusing to have a fisherman dressed in characteristic attire, seated on a high board or platform, with a rod and line. An assistant dives under, baits the hook from time to time with various objects, such as fish, a foot, a hand, etc.

Diving Family

A couple of boys or girls may act the part of the Diving family. Effective costumes, dialects and good pantomime are necessary to make this act a success.

The father first attempts to teach the very timid mother to dive. The usual squabbles and disputes follow, resulting in the father pushing the mother in. She frantically calls for help and finally swims to the side, using an old-fashioned breast stroke.

A similar scene occurs between the sister and brother. Brother struts out on the board, showing off, trying to convince his frightened sister how easily it can be done. She starts out bravely, but flops in.

The brother then proceeds to teach the spoiled baby how to dive.

Mermaid's Tea Party

Place a table float in the tank about twenty feet from the edge. Have the participants garbed in Japanese kimonos, flowers on their caps, carrying Japanese parasols. Walk in characteristic Japanese fashion to the edge of the pool. Remove kimonos, enter the water, carry tray containing plate, cup and saucer. The hostess and other swimmers carry the tea-pots and cakes. Then all join in a social tea while chatting and eating (see Fig. 3, page 239).

Pierrot and Pierrette

If possible select the extremes in height and build. Pierrot may be the tall or short member, whichever proves to be the most comical.

Pierrette wears white maline collar, ankle- and wrist-bands and a fluffy eight-inch skirt about the hips and over her black swimming-suit. Pierrot is dressed in white or black pajamas with large contrasting buttons down the front of it. Both wear cone-shaped hats.

Surf-Board Riding: George D. Freeth, world's champion surf-board rider.

The scene opens with Pierrette coyly walking and dancing about. Suddenly Pierrot discovers her, a flirtation and dance follows. Pierrot may assist Pierrette while she walks the tight rope (the rope stretched across the pool), or while she attempts to dive, or he may take her canoeing. Then in the midst of his ardent love-making they fall in the water.

A lively couple and good pantomime are necessary to make this act a success.

A Rescue

While some exciting event is going on have a person fully dressed fall off the board and feign drowning. Then have the life-guard run, dive in, rescue, carry out of pool and start resuscitation.

This may be conducted as a serious event or as a "take-off" on some of the antiquated methods of life-saving procedure.

6. DIVING STUNTS

Australian Splash

Execute a running dive from the board, jump up, bend and clasp the knees, enter in a sitting position.

Backward Roll

Stand several feet from water-end of board, sit, execute a backward roll, and enter head first.

Chain Dive

An effective dive is made by a large group if lined up on one side of the pool. Stand with the feet together (or kneel), then lean forward, grasp the right ankle of the person standing to your right with your right hand or both hands. The first person to the right starts the dive; when he is just about to enter the water the second swimmer follows and so on down the line without breaking the chain.

Clown Diving

Garbed in a clown costume, carrying balloons, umbrellas, etc., go through a series of dives, imitating different animals, funny persons or the various dives performed.

Diving for a Ball

Have some one throw a polo ball into the air while a diver jumps for it, trying to catch it. Contestants may dive from a platform or spring-board.

Double Dive (Header and Backward Roll)

Number one stands on the edge of the board, facing the water. Number two jumps to position on number one's back, places his legs around his waistline, hands on his shoulders. Number one enters in a header position, while number two pushes himself backward, entering the water in a semi-back somersault, close to the board.

Double Dive (Header and Foot Entry)

Number one lies on his back with his neck over the end of the board, legs raised, with his feet placed against number two's abdomen. Partners clasp hands while number two balances himself for his dive. Number two pushes off, holding a swan dive position, while number one enters feet first.

Shoulder Stand

Standing on the end of the board number one supports number two while standing on his shoulders, then both dive forward.

Double Dive (Work-Up)

Sit facing each other about three feet from the end of the board. Place hands on each other's shoulders, arms extended. Place your feet under partner's legs, bend the knees. Then lean forward and backward, pushing against each other's shoulders until you work your way to the end of the board. The one with his back to the water enters in a back somersault, while the other one enters in a front dive.

Follow the Leader

Choose a leader and attempt to follow him in whatever diving stunts he may choose.

Forward Roll

Stand on end of board, grasp toes, roll forward, enter water in this position.

Hand-Stand Dive

Grasp the end or sides of the board, spring into a hand-stand position, finishing with the back arched, feet over the head, legs extended, toes pointed (see Fig. 3, page 151). Hold this position for a few seconds, then take off by pushing with the hand. Enter close to the board, body extended, as in a front dive.

Head Stand

Assume a head stand on the end of the board, support the body for a moment by the head and hands, then fall backward and enter the water feet first.

Simple-Simon Dive

Select some one who can portray Simple Simon. Then with a rubelike, vacant stare, point your finger overhead and look up, while slowly walking forward on the board. Fall into the water holding this position. Disappear and reappear still holding the position for a moment.

Standing, Sitting, Standing Dive

Stand on the end of the board, quickly sit, regain standing position and dive in.

Statue Dive

Stand on the edge of the board or take-off, arms in a vertical position or at the sides. Fall forward or backward.

Double Statue Dive

One member stands erect, the other assumes a head stand, then grasp each other's ankles and fall forward.

7. CANOE RACES

A great variety of canoe and boat races might be held in conjunction with the open-water swimming program. The following are a few suggestive races and stunts:

(1) Canoe race, doubles, out and turn.
(2) Canoe race, four paddling.
(3) Canoe race, doubles, Indian paddle.
(4) Canoe races, paddling while standing.

(5) Canoe races, paddling while standing on the gunwales.

(6) Hand paddling, two or more in a canoe.

(7) Teams of twos, swim out to a canoe, climb in, return to finish-mark paddling.

(8) Paddle out to a given mark, upset canoe, right it, paddle back.

(9) Paddle out to a given mark, capsize canoe, undress, swim back.

(10) Canoe race, doubles. Paddle, dive without tipping canoe, swim and change places; get in the canoe and paddle back to the finish-line.

(11) Canoe-tilting contests.

(12) Single and double canoe races, war-canoe races and fancy, drill formation with the canoes.

8. LIFE-SAVING COMPETITIONS

Surface Diving

Teams compete against each other bringing up objects in a designated time.

Disrobing Race

The swimmers line up at the deep-water end of the pool, dressed in old clothes, consisting of waists or coats, skirts or trousers, shoes and hats. At a signal participants dive into the water, swim twenty yards, disrobe and continue swimming at least twenty yards or the length of the course.

Another variation of this race consists in disrobing as quickly as possible followed with a twenty-yard swim or a rescue.

Fireman's Carry

Teams compete with each other in taking subject from the pool by means of the fireman's carry (or substituting the pool lift). Basis for judging: time and correct technique.

Tank-Rescue Demonstration

Swim to struggling person, effect rescue, carry to side of tank, lift subject out and start resuscitation.

Throwing Life-Buoy and Towing Subject

Teams compete, throwing for accuracy and employing the correct technique for towing

Release and Rescue Competitions

Individuals or teams compete demonstrating correct approaches and breaks.

Rescue Race

Start in shallow water with a partner of same weight. On a given signal tow subject the length of the pool (twenty yards or more) while using any carry.

Resuscitation Competitions

Upon a given signal place subject in position for resuscitation and continue until the word "Halt!" is given. Competitors are judged by their ability to employ the correct technique.

Canoe Competitions

(Refer to page 248, Canoe Races.)

Boat-Rescue Contests

The boats must be uniform. The competing crews will consist of two or more members. If possible, have one act as the helmsman. Station a swimmer at least a quarter of a mile away from the starting-point of each team. Upon a signal all crews launch their boats, row to the rescue, lift subject into the boat and return with rescued. (The competition may also be conducted by pretending that the victim is drowned and having the rescuer start resuscitation as soon as subject is placed in the boat and continue for several minutes after subject is placed on the beach. The one finishing first, using the *correct technique,* wins.)

Surf-Rescue Competitions

Teams of three or more men line up on the beach ready for the rescue. Upon a signal subjects jump from the life-boat and continue struggling until rescued. At the same time the rescuer plunges through the surf with his can-buoy or life-ring. The assistants on the shore regulate the line as he goes to the rescue. When the rescuer gets his man he signals for his team to haul in (by raising his arm three times). As soon as the

rescuer is able to stand his assistants rush out, bring in the subject and start resuscitation. Winners are determined by the accuracy and speed of the rescue. (This event requires trained contestants or life-guards who are familiar with the conditions of the surf and able to take care of themselves.)

CHAPTER XII

HOW TO TEACH

If swimming is to rank in dignity with other educational subjects it must be taught in accordance with the fundamental laws and principles of education.

1. THE LAWS OF EDUCATION

Every teacher should be guided by the laws of learning or the habit-forming processes, since successful teaching is based on the way people learn. (Refer to Professor E. L. Thorndike's "Educational Psychology: Briefer Course.") The three laws of learning are:

(1) "The law of exercise" holds that repetition (or "practice with satisfaction") is a necessary factor in the learning process. So drill the class on each assignment a sufficient number of times until the idea has been successfully carried over into action.

(2) "The law of effect" asserts that we tend to repeat that which is satisfying and avoid that which is annoying. Therefore conduct your work in such a way that the students will have a feeling of satisfaction. This demands the proper planning of your lesson; following a detailed progression from the simple to the complex; helping students to solve their problems; and teaching them how to think in a motor way; that is, helping them to visualize the body in movement. To accomplish this have the students determine their problem or objective. Then go into a discussion of the theory, or "the why," behind that particular problem. By means of the scientific method of approach attempt to reach a successful solution by a carefully thought-out application or experimentation in the water. Finally, have them carefully and constantly check their ideas with their movements, this to determine whether they are being executed correctly. This necessitates an intelligent direction of their

movements, taking it very slowly at first, so that they can verify each idea with the result. If needs be, go to the extreme to reach the mean. Thus assuring one of getting a conscious connection between the idea and the result. Make your period one of joy, teach through play and with music, and have a real interest in your work.

You can see that there are many consequences that follow application of this second law.

(3) "The law of readiness" states that if one is set or determined to accomplish a certain objective (or if neurone paths are ready to conduct), to do so is satisfying, not to do so is annoying, and likewise so is coercive measures (or compulsory conduction) annoying. In other words, when your class is interested and ready to practice a given lesson, to introduce irrelevant subject-matter, to delay it, to waste its time, is most annoying. Also, to force your pupils to do anything which they are not interested in doing, but simply because you feel that they should do it regardless of their interests or needs, results in dissatisfaction. Avoid resorting to coercive measures.

2. THE PRINCIPLES OF TEACHING

Based on these laws are the principles of teaching.

According to Professor McMurry, the leading principles of teaching demand that:

(1) A purpose or motive be present.
(2) That the students demonstrate their ability to collect data, organize their work and solve their own problems.
(3) That they be able to evaluate their own work.
(4) That an adequate training for initiative and self-direction be provided for.

(Refer to Professor Frank M. McMurry's book "Elementary Standards," published by the World Book Company.)

Your success as a teacher hinges upon your leadership, your ability to encourage your students in self-activity and to enlarge their opportunities for physical and mental growth.

3. THE AIMS OF PHYSICAL EDUCATION

Briefly stated, "physical education should aim to provide an opportunity for the individual to act in situations that are physi-

cally wholesome, mentally stimulating and satisfying and socially sound." This is Professor Jesse Feiring Williams's summary of what physical education should stand for. (Refer to his books, "The Organization and Administration of Physical Education," published by Macmillan Company, New York, 1922, and "Principles of Physical Education," published by W. B. Saunders Company, Philadelphia, 1927.)

Conduct your swimming program so that it will function in the life of the individual and serve as a part of his citizenship training. Plan your work so that he is given an adequate and wholesome physical training through swimming and its allied branches. Safeguard him by means of a medical examination as well as careful supervision. Especially is this necessary for the adolescent boy and girl. The thought-content of your work must be sufficient to be mentally stimulating. Correlate your swimming work with other school subjects. Take advantage of every opportunity for inculcating ideals of good sportsmanship, fair play, loyalty, truthfulness, courage, initiative, service, tolerance and kindness to others, etc. Help him to build up the proper health habits.

4. METHODS OF TEACHING

Successful teaching demands the following:

(1) Adequate Technical Training and Thorough Knowledge of Subject-Matter

The qualified swimming instructor or coach, if possible, should be a graduate from a university or recognized school of physical education, and have a special training for the teaching of swimming. He should have a technical training in the theory and practice of teaching in accordance with the highest educational and physical-education standards. Having exceptional ability in the art of natation or being a record holder is not sufficient.

(2) Planning the Work to Meet the Needs of Your Group

Your method of procedure will depend upon the age, ability and desires of your students as well as the amount of time allowed for the course.

Suggestive Lesson Plan for a Class of Beginners: Assuming that you will meet a class of adults for the first time and that your teaching-time will consist of half-hour periods, with or without assistance, the following is a schedule of the first day's work:

LESSON I

Before learning to swim what preparatory measures will help you to gain confidence? (One main problem which motivates the work, or is of great interest to all beginners, during the first few lessons.)

FIRST PART OF LESSON (Theoretical discussion and land practice):

(a) Carefully study your assignment (see Introduction, methods of study, pages xii and xiii; Preliminary Steps for Inspiring the Novice With Confidence, page 1; and Breath Control, page 2).
Be prepared for a class discussion and questions concerning the problems of breath control.
(b) How can one avoid choking?
(1) Are there any conditions under which you would deem it safe to put your head under water?
(2) How might you get the correct feeling of breath control before attempting it in the water?
(3) If the nose is not held, how could you avoid choking when the head is submerged?

SECOND PART OF LESSON (Water application):

(a) Introduction to King Neptune's realm (page 1).
(b) Jumping the breakers (page 1).
(c) Class, then individual, practice of breath control (Exercises 1, 2 and 3, pages 2 and 4).
(d) Partners' introduction (page 5).

(3) Employing a Tested Method

In the past people have learned to swim as best they could. They have been taught by methods of imitation or through dictation. To-day the tendency is to teach by means of the project method, one of experimentation by the individual.

The "whole," or natural, method has proved most effective

for teaching all groups. Whenever possible, always present the stroke you are to teach as a whole while stressing the correct body position, timing, arm and leg actions, and breathing; then refine details of the stroke. However, some individuals prefer learning a stroke by mastering each part and then combining them (see Progressive Steps for Learning or Teaching Strokes, Groups I and II, pages 49 and 50; refer to page 263, for Important Teaching Points).

(4) Teaching Through Play and With Music

Whenever possible present your subject-matter by means of a game. Also use the various games given in Chapter XI as a means of providing physical and social recreation as well as offering an opportunity to give your students citizenship training through play.

Music as well as play is invaluable as a means of dispelling the beginner's fears. In addition to establishing the desired rhythm it eliminates the monotonously formal counting and it helps to give the wanted relaxation, resulting in a lessened expenditure of energy and a more effective action, a feeling of satisfaction and joy.

A phonograph, piano or violin may be used. The classical waltzes, and especially the Hawaiian waltz music, have proved to be the most effective. Students have highly indorsed swimming with music.

(5) Using Land Drills

Land practice is necessary when teaching swimming because it enables the novice to concentrate his attention upon any coördination without the handicaps of fear, breathing, body balance or any other difficulties. Also, you are able to tell at a glance whether or not your class is prepared.

Successful results are dependent upon your method of conducting drills. Have the class execute the drills about the pool or while standing or lying in shallow water (if it is warm enough), for it more nearly approximates the actual situation.

Permit the class to execute the drill the first time unassisted, then comment upon its results. Question and discuss with the class the salient points which should be stressed. Repeat movements until you are sure the class has learned the assignment.

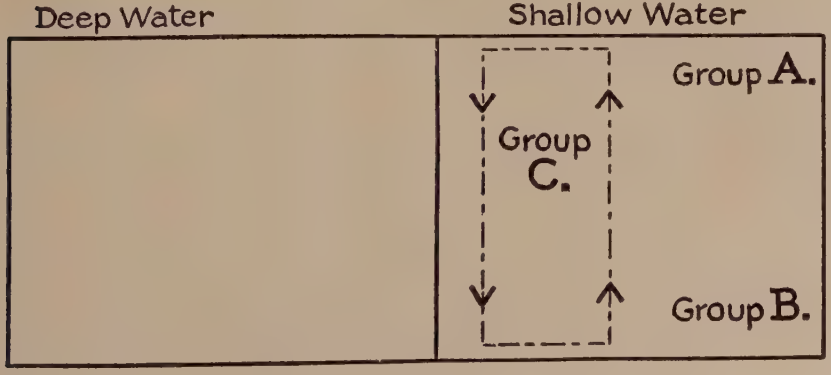
Eliminate formal drill methods. Do not direct your class in the way you might a gymnastic drill or formalized mimetic exercises. Make it realistic, as nearly like the actual swimming situation as possible, this in order to get the maximum of "transfer." Have the students feel the water and imagine themselves swimming. When they have learned their movements, let them practice with the music for rhythm. Or permit them to direct their own movements, repeating the story aloud as given in the text. When going through the swimming drills, it has been found helpful to have them take a step during the pull or drive of the arm stroke. This motion-picture land drill helps them to visualize the swimming stroke more accurately.

Swimming land practice forms one of the most important units of the natural program of physical education. If conducted correctly and given during the swimming season, or in conjunction with the swimming work, the transfer is direct, and it can be made most enjoyable.

(6) Organizing the Class Work

Successful results in teaching are also dependent upon careful organization of your work.

When teaching a class any assignment always allow for individual differences in coördinative ability. Then organize your work so as to obtain the maximum use of the pool. For example, when first teaching the elementary back stroke part of the class will be attempting the fundamental floating position. Have this group, A, work in couple formation at the shallow area of the pool. Another group, B, will be practicing on the opposite side of the pool, executing some part of the stroke pre-



paratory to swimming it; while group C will be swimming over in one lane and returning in the other. (See diagram, page 257.)

Then have your assistants help each group, giving individual corrections. If you are teaching unassisted divide your time so that you will be able to give part to each group.

(7) Abiding by the Theory of Progression

(a) Progress from the known to the unknown.
(b) From the simple to the complex.
(c) From the more simple coördinations to the more complicated ones.
(d) Consider the progression peculiar to each stroke (or exercise), which is based on the way people learn and the best theory of swimming, which will give the most effective results. *Adapt the stroke to the individual and not the individual to the stroke!*

(8) Abiding by the Theory of Corrections

(a) You should first correct the key or fundamental faults, which will automatically eliminate others.
(b) To break down old connections or habits *temporarily* exaggerate the corrected position until the fault is eliminated.
(c) Your success as a teacher and the pupils' rapid progress are determined in part by your effective corrections as well as the students' understanding of them.

(9) A Correct Usage of Commands

The following few suggestions as to how to give commands and present your lesson will prove helpful. The commands are necessary in mass instruction as a means of securing unified efforts.

Most commands are composed of three parts, as,

(a) The descriptive or explanatory part, which should inform the class of what is to be done.
(b) Following the descriptive part should come a pause, in order that the class may think or visualize what is to follow. The length of the pause is determined by the simplicity or complexity of the command and the rhythm desired.

(c) The executive part of the command is the part which demands immediate execution.

The following suggestions regarding the importance of the voice in giving commands cannot be overemphasized. The descriptive part of the command must be enunciated clearly in order that the class may hear, and in about the same tempo as ordinary conversation.

The time and length of the pause vary with the simplicity or complexity of the exercise and the rhythm desired.

The command of execution should be given in varied quality, intensity and inflection of voice, depending upon the exercise. A quick movement would demand a short, snappy command of execution, ending with a somewhat rising inflection of voice. A slow movement would demand a slow command of execution ending with a somewhat falling inflection of voice. Thus it is noticed that the rhythm of a command is indicated by the voice. The elementary back stroke is used to illustrate.

"Up slowly, inhale—One!"

"Out slowly, exhale—Two!" The commands of execution, "One!" and "Two!" should be given slowly and with a falling inflection of the voice.

"Down forcibly, exhale—Three!" The command of execution "Three!" should be given quickly and with a somewhat rising inflection of the voice.

"Hold, exhale—Four!"

Most effective results are obtained by conducting the classes in an informal manner, using the whistle as the command of execution when possible.

PRELIMINARY LAND DRILL:

If a formal line-up of the class for the land drill is desired, proceed as follows:

"Line Up! At the command "Line up!" arrange the class in any number of lines desired, according to height, depending upon the size of the class and space available.

"Arms forward—Raise!"

"Arm sideward—Raise!" At the command "Raise!" have the class adjust its distance by raising the arms front or side horizontal, depending upon the space needed and the stroke used.

"Arms—Position!" At the command "Position!" have the class quickly bring the arms down to the sides of the body.

"Class—Attention!" At the command "Attention!" have the class assume the best possible standing position.

Too much stress cannot be laid upon the necessity of giving posture training throughout all the swimming drills. For the trained teacher of physical education it is merely a matter of application.

(10) A Pleasing Personality

The instructor's attitude and personality are potent factors and are also responsible for successful teaching. Maintain an atmosphere of cheerfulness, be patient, tactful and encouraging. Once the student realizes that you understand his point of view and are sympathetic you gain his confidence.

(11) Organizing a School or Camp Program

(a) Meet the group, discuss their objectives and help them to plan accordingly. When offering your suggestions bear in mind always their interests and needs.
(b) Classify your groups according to their ability, as beginners, intermediates and advanced.
(c) Organize leaders, classes.
(d) Conduct bi-monthly or monthly meets, consisting of swimming, diving, life saving, water games and boating stunts.
(e) Keep a record of each group's progress.
(f) Give awards on the basis of each group's average.

5. TEACHING THE DEAF AND BLIND

Teaching the Deaf

The best results are obtained by means of the sign language, or imitation, and a constant criticism of faults. Giving directions by lip-reading is not successful because of the limited vocabulary. Abstract terms must be limited for every word has to be taught as a separate fact.

Group response is somewhat difficult because of the lack of hearing. Mutes seem to lack fear and, possessing as they do an unusual sense of rhythm, it is a great help.

Water Pageant: Figs. 1 and 2. The entrance. Fig. 3. The setting.

Teaching the Blind

In teaching the blind, to get results, the teacher must elaborate the movements with word pictures, detailed instructions and a sense of touch. When teaching a difficult coördination it is helpful to go through the movements holding the pupil's arm or leg, for this furnishes the necessary illustration and gives the "feeling" of the action, especially if it is done in the water. Going into the water with a person who is blind, if a beginner, eliminates his very noticeable fear.

6. SWIMMING AS A CORRECTIVE AGENCY

Specialized swimming skills offer the trained teacher of corrective gymnastics unlimited opportunities for correcting postural and feet defects, functional heart conditions, paralysis, constipation, etc.

It is easier to reëducate muscles in the water because one is not handicapped with the weight of the body. If fear is eliminated, and the work is conducted on a play basis and given with music, it is most satisfying to the pupil.

7. WATER PAGEANTS AND FESTIVALS

The progressive swimming director has unlimited possibilities for correlating his work with other departments. We are beginning to realize the need and educational value of water pageants and festivals as a part of a comprehensive swimming program.

The history, English and science departments could give many valuable suggestions concerning the sources of material, its organization and presentation. The customs, legends, myths and poems of different countries and the history of swimming itself would serve as themes which could be utilized for water pageants.

It is helpful to coöperate with the music, art and physical-education departments. For a successful pageant is dependent upon suitable music, artistic settings, the proper costuming and color schemes and dancing. This essential part of the work offers the students an opportunity to engage in all sorts of interesting projects.

Regardless of the type of pageant used, the theme should be arranged so as to allow for water stunts, games, swimming

and diving exhibitions and possibly life saving, for the display of these accomplishments in an unusual setting is the chief reason for holding water pageants (see page 261).

In addition to determining the theme of the pageants and the means for carrying it out most effectively it is equally important to organize the work by means of the executive committee and its sub-committees. The executive committee would be responsible for deciding the policies, for guiding all other committees and for making out the budgets. The following additional committees would be needed to carry out details of the work: cast, music, dancing, costumes, properties, stage, backstage management, stage direction and production, water activities and publicity.

A book on "Water Pageants and Festivals" by Nina B. Lamkin and the authors is in preparation.

8. IMPORTANT TEACHING POINTS OF CHAPTERS

Helpful hints on "how to teach" the material presented in the foregoing text follows:

CHAPTER I (Page 1)

BEGINNER'S FIRST LESSONS

1. PRELIMINARY STEPS FOR INSPIRING THE NOVICE WITH CONFIDENCE

Swimming is not a habit resulting from an instinct or a tendency handed down. It is an activity (or skill) which must be acquired.

The fear of the water must be overcome by supplementing ignorance with knowledge, by affording the novice safe conditions in which to work out his problems, as well as having a sympathetic understanding of his needs.

The following list of suggestive games may be greatly enlarged to meet the needs of the different age groups. The instructor should present as much of his subject-matter as possible through these games, making them interesting by stressing the spirit of play and competition.

Introduction to King Neptune's Realm

By having the class join hands and enter the water as a unit, it demonstrates the psychological effects of group action, which establishes

courage and confidence. This enables the teacher to get the best results, because the student's attention is centered on playing the game instead of holding back because of fear.

Give the command "Inhale" slowly, follow it by a pause, then a quick whistle for the class to jump in.

When teaching at a camp, lake, river or at the seashore, have the class run or jump into the water.

Jumping the Breakers

This game serves two purposes, it dissipates the fear of ducking under and, when the water is cold, it may be used as a "warming-up" exercise. Jumping the breakers should be given frequently during the beginner's first lessons, since he is likely to become chilled through a lack of sufficient activity. Do not take time for a special line-up, but apply this game in whatever formation the class is in.

Beginners' Races

Usually the novice is not afraid to walk across the pool; but the nervous or timid ones, having the hands joined and making a game out of it, respond and enjoy it.

Then by having the class use the crawl arm movements while walking across the pool it has the feeling of swimming.

The chain race offers a variation from jumping the breakers and gives added pleasure.

2. BREATH CONTROL

The instructor should insist upon the class practicing the breath-control exercises at home. This concentrated effort increases confidence and avoids spending needless class time for reviewing the simple but necessary exercises.

No particular class formation is required while teaching the breath-control work. The students may be in line, circle, open formation or holding on to the railing.

The class may be directed by using the commands *"Inhale—under!"* (or a whistle might be used for *"under!"* in fact, it is preferable).

Ducking the Breakers

By insisting upon the students joining hands their attention is centered upon this and playing the game, and they are not concerned with the discomfort of having the water about the face.

Partners' Introduction

When a class meets for the first time there is usually a spirit of formality or restraint present. These informal games help to promote a feeling of good fellowship.

3. LEARNING TO BREATHE CORRECTLY

After the class has been assigned home exercises in breathing, have it review them at the pool. If costly faults occur and the breathing is not rhythmical, stress the major points and correct them individually.

If possible emphasize rhythm by breathing in time with music, or direct the class by using the commands, "Inhale—exhale!" "Ex" applies to the blowing of bubbles under water, "hale" to the exhalation of air above the surface.

4. FACE-SUBMERGED FLOATING AND REGAINING STANDING POSITION

Before having the class attempt to regain standing position, be sure that it can perform this exercise correctly while standing about the pool or in shallow water. At the same time have the students direct their own movements in story form by slowly repeating aloud: "Knees up, arms down, feet replace, head up!" Stress the importance of having them remember that their safety-valve is—*"knees up!"*

For the students who find considerable difficulty in regaining standing position, have them go through each step slowly and thoroughly. At the same time have some one standing by, lightly touching their wrists, so that the timid one feels safe. An unlimited amount of repetition, patience and cheerfulness is necessary.

When teaching face-submerged floating emphasize the importance of the correct starting position, since a good float depends upon this. During the float observe that the face is submerged, the body relaxed and that the arms and legs are apart, which give one a greater feeling of steadiness.

After you have discussed the main points of the lesson question the class concerning its assignment for attaining standing position from face-submerged floating. It is usually wise to have the students first go through the movements unassisted while standing about the pool or in the shallow water. You may direct them by counting, sounding four whistles or by having the students repeat the story aloud. When having the class attempt this exercise in the water, you might direct it as follows:

"Starting position for face-submerged floating—Take!"

First whistle, will signify floating.

Second whistle, to let go and get up unassisted.

5. FLOATING AND REGAINING STANDING POSITION

When teaching the class to regain standing position from the back float have it stand in shallow water. Insist upon the students reviewing each step of this exercise, thinking through the movements while repeating

aloud: "Knees up, head forward, arms scoop, feet replace, head up!" Their safety-valve is—*"to bend forward!"*

The outstanding fault with the difficult case or timid one is trying to get up by holding the back rigid. Correct this by having him stand in the water, relax the body, bend forward, attempting to touch the knee with the chin; or get up from the floating position by first relaxing and sinking the hips, as in a sitting position, then attempt rolling forward and ducking the head by means of the forceful arm scoop. Safeguard the very timid person by having some one standing in back of him, ready to push the head forward if needed.

During the back float insist upon the correct starting position, as this largely determines the floating position. The chief fault committed by the novice is trying to get the feet up instead of *leaning back and getting the hips up,* the feet will then rise to their floating level.

Some individuals naturally float lower in the water than others. Often an instructor mistakes this for poor floating position and spends needless time trying to correct it. This case demands raising center of gravity by slowly extending the arms over the head, finishing with the back of the hands resting on the water surface, pressing the head well back, and slightly bending the knees outward.

Individuals who float below the surface should start their floating position with a push-off, then execute the stroke.

6. CHANGING BODY POSITIONS

For the difficult cases stress the need of the correct start and finish position, of relaxation and of the quick head and body turn accompanying the arm movements.

CHAPTER II (Page 23)

DEEP-WATER EMERGENCY TESTS

Every instructor should realize the necessity of teaching the emergency tests as a means of reducing drownings due to ignorance. It would be better not to teach an individual to swim unless you can qualify him as a swimmer and enable him to meet the ordinary emergencies.

Your standards should be very high and you should rigidly observe each part of this test, rating only those individuals as swimmers who are capable of passing it and who can swim at least three hundred yards proficiently. It is not sufficient to pass this test once, but constant theoretical review and application are imperative. Your aim or ideal should be: *Every individual a swimmer and every swimmer his own life-guard, then, if properly trained, the life-guard of others!*

1. PRELIMINARY TESTS

A careful review of these tests helps to establish confidence and prepares the class for its deep-water practice. Make sure that it has mastered floating, treading water and can safely swim across the pool before attempting the tests in deep water.

2. TESTING BODY BUOYANCY IN VERTICAL POSITION

Have the class review this test several times, until it is convinced of the upward pressure of the water while floating vertically.

When teaching the second and third part of this test at first have the class work in partner formation, as a means of safeguarding it and inspiring confidence.

Instructor or assistants should illustrate these tests from time to time, showing how easily they can be accomplished if executed correctly, and how costly the fault when incorrectly performed.

If teaching at a camp or in the open, substitute the use of the rail by having your students hold on to the dock, floats, rope, buoys, rocks, boats or any equipment in deep water.

While directing a large class, stand in one corner so all can see and hear you. Then speak slowly and distinctly. After the general directions have been given, use the whistle (or the verb) for the final command of execution.

If this test is given to men or women who cannot float (who lack buoyancy), eliminate this step and proceed with the following tests:

3. TESTING EFFECT OF CHANGING ARM POSITIONS WHILE FLOATING VERTICALLY

The value of this test cannot be overemphasized, because it demonstrates to the students the causes of sinking and how to save one's self.

Have the class prove through repeated experiments that a forceful upward movement of the arms sinks the body, while the forceful downward drive will lift the body. Therefore stress the fact that when attempting to reach the surface one must diminish the upward force and accentuate the downward movement.

5. DEEP-WATER APPLICATION OF EMERGENCY TESTS

Adequate preparation, careful organization and planning are imperative for successful results.

Before permitting your students to take this test, have them review the important steps repeating aloud (or in words to this effect): "To sink, raise the arms; to recover, arms down and scull; at the surface, head

back, float or tread; clear air-passages; scull and, if calm, swim the resting back stroke, crawl or side stroke." Then call for volunteers and have only two or three swim at one time. Make sure that the course is clear and carefully supervised by yourself or by assistants. Warn those making the test against grasping each other in case of a collision, instead to simply float or scull until a clearance is made. Also warn your students that, when excited or struggling, to tread water or place the head back, with the *chin in,* and float or scull.

Observe the timid ones individually and for the first few attempts have them keep close to the side of the pool until confident and able to make the test unassisted. Make sure of a correct start for the back-floating position by gently touching the chin if necessary as the pupil comes to the surface.

If a beginner becomes excited during this test call to him, giving the essential warnings, which usually are "Chin in, look toward your feet, float or scull!" If he sinks, wait a few moments for him to save himself. Then, if he finally fails, rescue him. This situation rarely occurs if the most timid person has been properly prepared. However, if a novice were unable to save himself and had to be rescued call him to one side. Talk over the situation, having him tell you what happened, why he went down and what he should have done. Verify this, give help and corrections if needed. Then have him go through that same experience in shallow water and, when prepared, repeat the test in deep water. This sort of training is necessary to restore his confidence and to enable him to effectively meet such an emergency should it arise again.

6. TREADING WATER

When the class first practices treading in deep water, have it work in partner formation, number ones assisting by gently holding the shoulder-straps, while number twos attempt to tread, then change places. Also have it practice changing from face to back float to the treading position.

7. EMERGENCY DIVING

If using diving as a part of your deep-water emergency tests make sure that the beginner can first perform a correct kneeling dive in shallow water, come to the surface, swim, crawl or turn on the back and swim one of the back strokes. If the novice has mastered this dive and the first six parts of the emergency tests you should have no difficulty in getting the most timid one to undertake the standing dive in deep water. Again call for volunteers, let the students start with both feet together or one foot forward. Caution them to lower the head between the extended arms, bend forward and push with the feet.

When teaching large classes to dive, organize your work so that the

students will not dive into each other. (Refer to page 124, Elementary Diving.)

8. CHANGING STROKES AND TURNING

First drill your class on this test in the shallow area, then apply it in the deep water. If you have a large class number it off in twos.

When prepared, the class can take part in a game. Start teams from opposite sides of the pool. On a signal they will swim to the center and return to their starting-place, each team trying to get all of its members back first.

9. RELIEVING CRAMP WHILE FLOATING

A discussion of the causes and remedy of cramps is necessary as a means of safeguarding the individual. The class should practice that procedure while in deep water.

10. THE GRASP, THE RELEASE AND SWIM

Be sure that the class is capable of passing this test in shallow water before trying it in the deep end. Warn the class against making it too realistic at first, because a real rescue might be necessary. As it acquires greater skill, permit the students to hold firmly and break the grasp. Also teach the life-saving breaks, carries and resuscitation. (Refer to pages 178, 182 and 186.)

11. SWIMMER'S SAFETY TEST

Insist upon all of your students passing this test, for they are not swimmers and able to take care of themselves until this minimum requirement is satisfied.

12. OPEN-WATER SAFEGUARDS

When teaching in open water or at a camp do not allow any one to go beyond his depth until properly tested. Classify according to the tests and use a suitable cap, band or suit to designate each group. To illustrate, beginners red caps, intermediates white, advanced blue. If your students want to undertake a distant swim, always accompany them with a guard in a properly equipped life-saving boat. (Refer to page 211.)

Review in theory how the various open-water emergencies may be met. When accompanying your class on a swimming party at the ocean, lake, river or open bathing-place, caution it beforehand and decide upon all possible protective measures. Properly trained life-guards should be

present as well, but always emphasize the point that each swimmer must be his own life-saver.

CHAPTER III (Page 41)

SWIMMING FOR CHILDREN

In order to obtain the best results you should have a genuine love and interest for teaching children, otherwise your efforts are forced and the child's response half-hearted.

Instead of following a set procedure of your own making, sound out or question the class, then use its reactions and interest as a basis and guide for planning your lessons.

Your method of procedure should be determined by your understanding of the child's psychology as well as its needs. Children from five to ten years of age are appealed to through the imagination, being particularly interested in stories of animal life. Therefore introduce such stories that have a direct analogy to your swimming lesson. Since the child learns mainly through imitation it forgets itself and its fears while its attention is focused upon imitating the dog, seal or minnow, which you may have just discussed in the story. Children also learn by imitating each other. Call for volunteers or choose the children who are best able to demonstrate the stunt, exercise or stroke which you are teaching. Most effective results are obtained by frequently getting in with the children and playing with them. Water-wings are helpful for the timid ones.

In teaching any stroke, first present it in its entirety, then refine its movements, since most children naturally learn this way. Those who find difficulty in learning by the "whole" method should master each part as listed in the text and then combine and refine the movements. Start with the dog paddle, have the child swim the coördinated stroke with the head raised, arms recovering under water. Then follow with the coördinated sculling or back stroke and the deep-water emergency tests.

The play impulse is a dominant factor in child life and is another means by which it learns. Therefore you should conduct your swimming lessons on a play basis, using the game as a means of holding their interest, for by weaving the various skills or strokes in the form of interesting story-plays the drudgery of formalized exercises through dictation is eliminated.

Since the attention span of children is short it is necessary to vary the program. Direct their attention for a few minutes on the analysis which requires concentrated effort (explain the work in their language), then substitute with a game, race, stunt or free play. Return from time to time to the more serious part of the lesson. In this way you are able to progress and teach the complicated stroke without tiring them or resorting to coercive measures.

The jingles or rhymes are a method to help the child to direct and establish its movements. Conducting the work by means of singing games or with music furnished by a phonograph, piano or violin affords the children an opportunity to express themselves or interpret their lessons in the form of rhythmic play.

By this procedure you obtain the coöperation and control of the class without the use of strict disciplinarian methods. The children respect you as a leader and look upon you as a sympathetic friend and one who understands their problems. The backward and timid child is brought out and the bold or unruly child soon learns self-control.

Your capacity as an instructor should not be limited to just the teaching of swimming, remember you are teaching children, so you should take advantage of every opportunity to inculcate ideals of fair play, service, courage, initiative, good manners, etc. You are also able to establish the proper health habits pertaining to the swimming situation as well as general hygiene.

CHAPTER IV (Page 46)

ANALYSES OF THE VARIOUS SWIMMING STROKES

Assign the class the stroke or the particular part which you intend to develop. Have it study the lesson, thinking through each movement as directed and checking the important features of each step, thereby enabling it to apply the theory in the most effective manner.

Then have the students review the assignment while standing about the pool in order to determine whether they are fully prepared. Follow this with a class discussion, questions or comments concerning the important points which you deem necessary to be stressed.

Have the class apply the lesson in shallow water, ask it to direct its own movements by repeating the explanation of each count aloud. Then insist that the students stop at the end of each count and determine or check the result, thus making sure that the idea has been effectively converted into the desired movement. To illustrate: If teaching the arm movement of the elementary back stroke, have the students review and stress the major points, as the necessity of taking *Count 1* slowly, with the elbow back and in, so as to minimize resistance; the need of slowly extending the arms diagonally upward during the interval of *Count 2,* so as to avoid sinking the body and to get the best purchase on the water; the importance of a forceful surface pull as a means of getting the maximum power from the drive and also aiding one in maintaining a horizontal-floating position during the interval of *Count 3;* of gliding at *Count 4.*

This procedure takes a few minutes but it is most helpful to you as well as to the student in obtaining the best results.

Then have the class slowly swim across the pool (using the arm

movement alone of the elementary back stroke) while attempting to apply the points stressed. Observe the results and give general class criticisms; if excellent, commend the class; if fair, point out the weakness and ask it to make corrections. The more the student feels his responsibility to detect his errors and correct them the better the teaching. Repeat this procedure, alternating class with individual work. The advanced strokes require more individual attention and time to correct the details.

If you wish to teach a stroke by means of the "whole" method proceed as follows: (1) Assign stroke for study; (2) have class discussion of main points (body position, timing, arm and leg actions, and breathing), and land practice, if possible; (3) demonstrate the stroke in the water, again stressing the main points; (4) get into the water with a student, have him practice the stroke while you are holding his body in place, and as soon as the student has the feeling of the stroke permit swimming across the pool; (5) have the class practice in partner formation, instructors criticizing; (6) have the class swim across the pool; (7) refine details of the stroke being taught; and (8) practice distance swims.

This procedure may be simplified further when teaching children. Illustrate the stroke in the water, stressing the main points; then have the class attempt to swim. Follow up with individual corrections.

Some instructors feel that successful teaching is dependent solely upon their ability to control the class, completely direct and correct every movement, without permitting the students to think for themselves. The day of pure dictation and imitation is passing. The modern and progressive instructor realizes that his teaching methods must be in keeping with the highest educational and physical-educational standards as well as having a thorough background in the best theory of swimming.

Before attempting to teach any assignment you should be thoroughly familiar with the details of the text and the progressive steps. When coaching an individual or class look for the key faults and give your criticism in a clear and concise manner. Refer the student to the Faults and Their Correction in the book as a summary of the prevalent errors which are incurred in each stroke, and let him correct accordingly. A keen analysis of the fundamental faults together with the student's understanding of them makes for rapid progress and successful teaching.

Not only is a thorough knowledge of the subject-matter imperative but you should carefully plan each lesson before meeting the class, bearing in mind always the objectives, needs and ability of your students. Arrange your weekly schedule so that the main problems and sub-problems stand out clearly, and make sure that your assignments are understood by your pupils. Review the preceding assignments during each lesson, if necessary, in order to perfect the movements and determine the status of your group.

The adequate organization of your work is a potent factor which makes for effective teaching. Usually a few minutes at the beginning

of the lesson is used for class discussion, questions and analysis of the strokes, this enables students and teachers to check results. Part of the period will be devoted to having the class stand in shallow water while working on the arm technique or any part of the stroke. Then you will have them line up along one or both sides of the pool for further analysis and practice of the leg movements. This probably will be followed by having the class swim across the pool (as a unit or in turn, or as ones and twos), attempting to apply the main points stressed. All the while you will be observing their work and making general comments, offering suggestions for improvement, if possible. Or you may have them work for relaxation, endurance and form by distance swimming. Have the whole class swim down on one side of the pool and back on the other, keeping to the right. Usually the end of the period is given over to individual practice, games or free play.

This procedure is necessary in order to get the greatest use of the pool when you have to conduct large classes in a small area. Even if you are obliged to teach a group of varied ability during a single period, see that each section will have a place to work and with as little interference from each other as possible (see diagram, page 257).

The following is an epitome of the major teaching points which should be stressed when presenting the various strokes to your class:

1. ELEMENTARY BACK STROKE

When first teaching this stroke caution the class to think through each count, to perform the recovery movements very slowly, especially the second count, and to pause a moment at the end of this count. This eliminates the possibility of the novice sinking himself because of a rapid recovery. Then stress the value of a surface pull.

It is imperative to first teach the coördinated back stroke with a straight-leg kick, because the tendency of the novice is to exaggerate the knee bend, sink the hips and nearly "drown" himself. By using the straight-leg kick, the beginner is able to maintain a better body position, eliminate the mentioned faults and safely take care of himself in deep water. When the straight-leg coördinated stroke is learned proceed with the relaxed leg recovery, using a slight flexion and outward turning of the knees.

In addition to having your students direct the movements of the stroke by repeating the story to themselves and verifying it, have them sense the rhythm and timing of the stroke by thinking, "Up slowly, out slowly, together forcibly, hold." (Refer to the general introduction of this chapter, page 271, if necessary.)

2. SCULLING STROKE

Have the class work in couple formation, number twos practicing the coördinated stroke while number ones support twos' hips. Or start from

a back float or back push-off, then, when the body is gliding forward by means of the forceful arm action, combine the very easy, relaxed leg movements while toeing in. Gradually increase the power and speed of the class by coaching it to execute the kick with a slight knee bend and accentuating the upward beat or drive.

The sculling arm movement as explained in the IMPORTANT NOTE (page 62) has proved helpful for the individuals who find the arm action of the ordinary sculling stroke difficult.

3. SIDE STROKE

The majority of students find that it is more difficult to balance the body on the side. Therefore it is helpful to have the class learn the side push-off (and demonstrate its ability to correct faulty positions); that is, when learning the side stroke by the "part" method.

When having the class practice the scissors kick while holding on to the railing make sure that one hand is placed directly over the other and that it raises the top arm and looks under it toward the feet (see Fig. 4, page 69). This automatically adjusts the body in the correct side position. This step may be substituted for the side push-off practice.

When analyzing the arm movements you should stress, first, the importance of the surface pull with the right arm and, second, a slow and relaxed recovery with the palm forward (thumb up), hand cutting the water, to eliminate the costly faults of lifting and then tending to sink the body. Emphasize the need of recovering and pulling close to the body with left hand.

By having the class first use the top-arm action with the scissors kick correct timing is learned. And the possibility of lifting the body by a forceful right-arm drive or sinking it by a forceful recovery is eliminated.

When this step is learned teach the coördinated stroke, stressing the necessity of using a surface pull and gentle recovery with the right (or under) arm. Also of pulling in line with body's imaginary center line and close to it, which gives the maximum power and correct balance.

After the students have learned to swim the strokes correctly have them increase their power by using a deeper arm pull and a more vigorous leg action. Then encourage them to develop endurance by swimming four hundred yards or more.

4. SINGLE OVERARM STROKE

In order to get the best results analyze and stress the important points concerning the top-arm action. Having the class repeat aloud the direction for this movement is helpful, as, "Quickly bend, slowly extend, pull, swing out and cut (or flip)."

When the class is first attempting to swim this stroke, stress the point of having it start the recovery with the left-hand palm down, resing *on* the water surface. Then have it start the top-arm recovery with the elbow resting in the water, follow this by moving just the relaxed hand and forearm forward.

When this step is learned, coach the class to just clear the water surface with the relaxed top arm, elbow elevated slightly above the limp hand.

Having the students work on timing the breathing with the stroke is helpful as a preparation for the double overarm stroke. The top-arm technique is nearly the same, so this is a splendid transition stroke.

5. DOUBLE OVERARM STROKE OR MODIFIED TRUDGEN

If your students have progressed from the side strokes, stress the correct analysis of the arm movements and illustrate how the transition is made. Also emphasize the need of turning the body from the side to the chest to facilitate the under arm recovery.

Having the class practice the leg mevoments while holding on to the railing enables you to stress correct breathing, head and body position.

6. TRUDGEN CRAWL

Some students find the trudgen crawl adapted to their style of swimming and easier to master than the crawl. When teaching it, emphasize the following points:

(a) Diminished body roll.
(b) A slight turn of the head for the inhalation.
(c) Reduce the scissors kick to fourteen inches and intercept it with a two-, three- or four-beat crawl.

7. PRELIMINARY CRAWL

Follow the text for your progression and detailed description of the stroke. In addition, stress the following teaching points:

Crawl Kick

Have the student practice the leg action while holding the railing with the top hand and bracing himself with the under arm. Then instruct him to turn the body and *look* to the breathing side, inhale, execute three or four crawl kicks; turn forward, *look* forward, execute three or four crawl kicks, exhale; repeat.

When first practicing it, insist upon having the class use a straight-leg action (to guard against the natural tendency of a marked knee flexion) and *toeing in.* Have it feel the drive *from the hips* to the toes with a spread of six to ten inches. Gradually work for power and speed by narrowing the thrash and slightly flexing the knees and ankles to give relaxation.

Arm Movements

When having the class practice the complete arm movements standing, check positions by stopping at the start, mid-position and finish of the stroke. During each one of the four stops ask any pertinent questions pertaining to the arm technique. Then have the students direct their own movements aloud, pause and verify them.

Coördinated Stroke and Breathing

When first having the class swim the coördinated stroke, emphasize the importance of employing the fast, powerful leg action, which automatically establishes the proper timing of the stroke and eliminates the body drag. Then work for the correct timing of the head with the arms; that is, turn and *look* to the breathing side until the left (or top) arm starts its pull, then turn and *look* forward until the right arm starts its pull. This facilitates breathing, makes the stroke even, affords proper balance and helps one in getting the correct arm movements. Also stress the final exhalation above the water preceding the inhalation, this to avoid choking and make the breathing easy.

8. CRAWL

Assuming that the class swims the crawl in fair form, refine its parts by following the progression listed in the text, correcting first the fundamental faults, which will automatically eliminate the minor ones.

Crawl Kick

Drill the class on the correct technique of the crawl kick and follow the progression listed in the text.

Arm Movements

Stress in detail each part of the drive. First, emphasize the need of exerting a steady downward pressure with extended arm so as to support and balance the body; second, emphasize the maximum of shoulder and arm power as the hand follows along the imaginary center line; third, shortly after the initial pressure make sure that the elbow leads until the hand nears the hip; fourth, see that the palm is turned in, having the hand

and forearm cut the water, thus reaching the surface with a short, forearm swing. Then start the recovery by bringing the relaxed arm and hand forward in this position.

If teaching the recovery, using the wrist flip, palm down and the quick elbow bend, make sure that the arm does not move forward as the elbow is flexed, so as to obtain the correct alignment of the hand and forearm preparatory to the extension. Remember that the head, arm and shoulder faults are so closely correlated that in correcting one it helps to eliminate the others.

When coaching for the correct arm movements watch that the shoulder does not follow the recovering arm as it reaches forward and, especially, that the top shoulder does not lead during the top-arm pull. It causes a double body roll and makes the planing position impossible. Check on the correct timing of the head with the arms.

Once the student is able to start his drive with the shoulder held back until the proper support is given, it will not be necessary for you to have him keep his head to the side until the top hand reaches catch position, but coach him to turn with it.

Coördinated Stroke

After making the preceding fundamental corrections, work for the correct body position, timing of the head with the arms, leg and arm timing, so that the coördinated stroke is properly synchronized.

9. RACING BACK STROKE

When developing the kick, it is helpful to have the class swim the sculling stroke, paying particular attention to the leg drive. If your students have learned the crawl it is comparatively easy to teach this stroke.

When teaching the arm movements be sure the class can perform them correctly while standing. Then have the students apply that technique while in the water, supporting themselves with their feet placed under the railing (if one is available) or working with a partner, or supporting themselves with water-wings. In this way the student is able to concentrate his attention upon the arm action while the body is held in correct position. When the student is able to perform the arm stroke correctly have him swim across the pool. Then correct the fundamental head, body, leg and arm faults.

10. BREAST STROKE

Follow carefully the progressive steps and stress the need of

(a) Pressing down as well as back during the arm drive.

(b) Continuing the downward pressure during the arm recovery so as to help plane the body.

(c) Spreading the knees laterally and keeping them near the water surface, then, pushing water back, snapping legs together.

(d) Keeping the head turned forward all the while.

If you are coaching the racing breast stroke and the swimmer uses a slight scissors action, correct it by having him bow the knees, hold the heels together.

CHAPTER V (Page 116)

RACING STARTS, TURNS AND PLUNGE FOR DISTANCE

1. RACING STARTS

When first teaching the racing dive caution your pupils to quickly lower the head so as to enter several feet under the water rather than hit too flat.

Then coach for the correct timing of the arm movements with the spring, and exerting as much force as possible.

Try out the different starts, so that the individual can determine which style is best suited to him. To check results, start the watch as his feet leave and stop it as his head passes a given mark.

Coach your swimmers to lose balance on the command "Get set!" (or "Ready!"), so that when the gun or whistle is sounded they will make a prompt start. Usually the swimmer will not be called back by the starter unless his body has touched the water after the sounding of the whistle or gun.

2. RACING TURNS

First make sure that your students have learned the correct technique for the turn while standing in shallow water. Then have them swim to the wall, and check results. Emphasize the importance of a quick turn by means of a forceful upper-arm pressure, at the same time scooping forward with the under arm, in order to push the body back near the wall. Finish with the arms in front-horizontal position, palms down, then push off quickly.

It is also valuable practice for the swimmer to perform the turn in the water without the use of a support, so as to perfect the rapid spinning about of the body, which is dependent largely upon the effective use of the arms.

Make sure that the student presses both hands against the wall simultaneously during the breast-stroke turn.

3. PLUNGE FOR DISTANCE

When coaching a swimmer for the plunge

(a) Give special attention to the exercises for breath control.

(b) Stress the correct and forceful take-off.

(c) Make sure that the descent is not too deep or the ascent too rapid.

(d) Coach him to keep his course by means of the correct head position and looking at the lines on the bottom.

(e) If he goes to the left of his mark, twist or bend the body slightly to the opposite side, or move the hands in the opposite direction.

CHAPTER VI (Page 124)

DIVING

1. ELEMENTARY DIVING

Porpoise diving may be taught as a game and is helpful for inspiring the novice with confidence and gives him the initial feeling of the spring, bend, dive and recovery. When teaching in a lake or river, or where a platform or support is not available, you may use this step as a means for teaching the novice the rudiments of diving. Have the class form in groups of threes, two forming a seat, the third diving.

When teaching the kneeling or sitting dive caution the class to keep the extended arms covering the ears, thumbs locked, to aim out and push off vigorously. This will avoid the tendency to drop in or bend too far forward and strike the bottom of the pool. Then call for volunteers, let them dive in, turn around and assist the more timid ones in regaining the surface if necessary. Organize your work so that the students will not dive into each other, and caution them to wait until the preceding group is out of the way. This organization and precaution should be taken for all sections in diving classes.

Progress your students as rapidly as possible. As soon as they have succeeded in getting a good push-off and entry position, work for a correct plain dive.

Before permitting the class to dive in deep water make sure that it has passed the deep-water emergency tests and can take care of itself.

The beginner should attempt Step 4 at least once, and with assistance if he dives flat. This safeguards the swimmer against going flat and gives him a feeling of correct entrance. Then let him try it unassisted.

When teaching Step 5, caution your students to *bend at the waist,* and to lower the head between extended arms, for if all else fails this will prevent them from going flat. To obtain a correct spring stress the

need of lifting the heels slightly and, as the body starts to fall forward, to bend and straighten the knees and to give the final impetus to the spring by forcibly extending the toes, having the feeling, if necessary, "That they are trying to push the wall back."

Gradually work for height, correct body position and entrance. Placing the hands at the side or in front horizontal position is considered the best starting position.

Once the plain dive has been perfected proceed to the elementary and advanced spring-board or platform diving.

3. LEARNING TO WORK THE SPRING-BOARD CORRECTLY

First Step—Arm Swing and Spring

Before having the class attempt working the board it is helpful to drill it in the technique of the arm swing and spring while standing about the pool. Reënforce your teaching by demonstrating and analyzing this step.

When having your students first attempt this exercise on the board caution them to stand back a bit and to take it easily, gradually working for height and the perpendicular body position.

Second Step—Analysis of the Step, Take-Off and Plain Dive

As a preparation for the spring-board practice, and as a time-saving method, it is most helpful to have the class go through this step on land first.

Before attempting to work the board have the students step it off. When performing the dive for the first time coach them to take a short step in order to make the preparatory jump high. Then to properly time the arm swing and spring with the board while keeping the body erect. Insist that the pupils quickly duck the head after reaching the height of the dive to avoid going flat.

Third Step—Running Front Dive

Be sure that the novice steps off his distance just before attempting to dive. Have him almost walk the board the first time, while emphasizing the final step and preparatory jump, the rebound from both feet, getting the maximum lift into the air and a correct entrance. Correct the key faults and gradually perfect details.

Make sure that the student has learned to work the board properly and has achieved height and form in the plain or swan dive, as this is the foundation for fancy spring-board diving.

4. PLAIN AND FANCY SPRING-BOARD DIVING

Swallow (or Swan) or Plain Dive

Assign *Exercises 1* and *2* for home or pool practice before having the novice attempt this dive. Then coach the diver to keep his head and chest raised and gradually increase raising the legs and arching the back.

Front Jack-Knife Dive

Coach the following points: Maximum height, exaggerated bend with the head up, close and correct entrance.

Back Jack-Knife Dive

If you follow the progression listed, making sure that the student has a three- or four-foot clearance before attempting this dive, there will not be any danger of the student striking his head. This dive is simple to teach and easy to learn if the progressive steps are followed.

Back Dive

If necessary hold the hips of each student when first teaching the back dive. This helps the student to get the correct feeling and guards against a flat dive. Do not permit the class to practice this dive from the edge of the pool. It is necessary to use a spring-board or any support extending well over the water as a safeguard against hitting the side.

Then coach for the maximum height, followed by the quick backward bend of the head, arms and body entering correctly.

For the remaining dives, carefully follow the progression and the essential details of the text. If necessary, your students should practice each preparatory step diligently before attempting the dive.

CHAPTER IX (Page 169)

LIFE SAVING

To qualify an individual as a life-guard is a serious undertaking. You should realize that it is your moral obligation to pass only those who are expert swimmers and fully capable of saving the life of another if put to the actual test.

Be exacting in each detail of the test. After reviewing the preliminary steps of the release and rescue measures, see that the work is made realistic. The final test of efficiency should be the ability of the rescuer to break any firm hold, carry and properly apply the prone-pressure method of resuscitation.

One should not set a definite time limit for the course of instruction, because this depends on the ability of the students, the size of the class

and the amount of individual help given. Frequent theoretical discussions, questions and demonstrations of the work are essential and comprise a vital part of the instruction.

Constant practice and yearly reëxaminations are necessary to adequately prepare one for the life-saving service.

Juniors, or those from fourteen to eighteen years of age, should be encouraged to study and practice the junior life-saving test. Usually, a person under eighteen does not have the serious outlook and full realization of his responsibility. However, if a person has exceptional ability, is capable of passing the senior tests and is physically fit, he should qualify.

7. Preliminary Life-Saving Tests

Throwing a life-buoy properly is an important part of the life-saving work and should be given in conjunction with the preliminary life-saving tests. When possible all candidates should pass the boat-handling and rescue-work and canoe tests. This is imperative for those who desire to become camp counsellors or life-guards, where the use of boats or canoes is indispensable.

8. Release and Rescue Tests

First have your students slowly review each step of the break and carry methods while standing on land or in shallow water. Observe and correct them. When you are sure that the students have learned the proper technique for each break and carry, have them demonstrate the drill as an actual rescue, omitting commands and making it realistic. This application may be made while standing about the pool or in shallow water.

LAND DRILL

The Line-Up

If a formal line-up is desired when teaching these drills, proceed as follows (or just ask the class to form in two lines facing in whatever direction you want them):

"Line up!" At the command "Line up!" have the class form, according to height, in two straight lines.

"Both lines toward each other—Face!"

"Arms sideward—Raise!" At the command "Raise!" adjust distance by raising the arm side horizontal, palms down.

"Arms—Position!" At the command "Position!" quickly bring the arms down to the sides of the body and assume a correct standing position.

Wrists Grasp, Break and Carry

Each member of the first line will act as the rescuer, or number one. Each member of the second line will act as the drowning person, or number

two. At the end of the drill reverse the order, number ones acting as the drowning victims, number twos the rescuers.

"Wrists—Grasp!" At the command "Grasp!" number ones raise their partially flexed arms, while number twos firmly clasp number ones by the wrists, with the thumbs up.

"Break!" At the command "Break!" number ones free themselves by applying force against number twos' thumbs.

"Body—Turn!" At the command "Turn!" number ones grasp number twos' wrists, right hand to right, and quickly turn number twos' bodies away from them, then assume a carry position. The object of grasping the wrist after the break is to protect one's self from further attack and also to maintain hold of the victim. Practice this drill, using the different wrist grasps, single and double.

"Carry!" It is not necessary to use a certain carry with each break, but review the different carries in combination with the breaks, so as to familiarize the class with each.

This demonstrates the method of teaching life-saving drills and serves as a pattern for teaching the other release and rescue drills. The commands used in the other drills will simply consist of naming the break and carry.

Then have the class approximate an actual rescue on land, or while standing in the water, without your directing it.

If the correct technique for each break and carry has been learned on land, have the class approximate an actual rescue in the water. When first applying the breaks and carries in deep water have the class go through them slowly enough so that you can observe each movement. When you are satisfied that the students can perform the various release and rescue methods correctly make it as nearly like an actual rescue as possible, stressing the best method of going to the rescue, the approach, the break (if caught), the carry, lifting the body from the pool and resuscitation.

WATER DRILL

The Line-Up

"Line up!" At the command "Line up!" have the class form in two lines, according to height, about the deep-water end of the pool. Number twos, or the victims, stand with their toes gripping the edge; number ones, or the rescuers, stand directly in back of number twos.

"Go!" (*or whistle*). At the command "Go!" number twos enter the water, using a shallow or racing dive, swim toward the center of the pool, turn about, and, while awaiting the arrival of number ones, frantically raise the arms above the head, submerge the body, as though drowning.

"To the Rescue!" Number ones enter the water and attempt to rescue number twos.

Wrists Grasp, Break and Carry (Made realistic)

"To the Rescue!" Number one swims to the rescue of number two, or the victim. During the approach, he attempts to assist number two and is grasped about the wrists. Number one breaks the wrist grasp (as described in the text, page 180), maintains hold of the victim, turns his body away from him, assumes the correct carry and returns.

Repeat the entire drill, number ones acting as the victims, number twos the rescuers.

Practice the various breaks and carries in deep water, following the form used in the preceding water drill.

Resuscitation Drill

"Number two's body in position for resuscitation—Place!" At the command "Place!" number one turns number two's body in a prone position with the arms extended above the head.

"Preliminary treatment—Begin!" Number one clasps hands under number two's abdomen, lifts the body several inches, while squeezing, then quickly drops it. Places the subject's arm and head in position for resuscitation. (See that the tongue is out, if necessary pull it forward!)

"Number one's position for resuscitation—Take!" At the command "Take!" number one kneels or stands astride one or both of number two's knees, placing his hands over the subject's lowest ribs.

"Press!—one and two and three and"—— Then press down and up. This position should be held for the length of a normal exhalation, about three seconds.

"Release!—one and two and"—— The rescuer leans back slightly, quickly releasing pressure. This position should be held for the length of a normal inhalation.

(In practice repeat the resuscitation drill for about three minutes. However, in case of an actual drowning, this drill must be continued until life is restored, or for at least an hour.)

"Circulation—Increase!" At the command "Increase!" number one vigorously rubs number two's legs and arms, taking care to rub toward the heart, thus increasing the circulation.

"Position!" At the command "Position!" both lines quickly assume a correct standing position. Repeat the entire drill, number ones acting as the victims, number twos the resuscitators.

CHAPTER X (Page 220)

SWIMMING AND LIFE-SAVING TESTS

The application of the swimming and life-saving tests does not demand that you follow the order given. The students may pass any part of the test at any time and be awarded accordingly. The minimum grade should be 75 and the maximum for each test 100 points.

As another means of stimulating a greater interest and encouraging each girl and boy to become a swimmer, his own life-saver and, eventually, the life-guard of others, some honor should be given. The nature of the award will depend upon the system used in each particular school, club or playground. It is suggested that the awards be graded according to the beginners, the intermediates, the advanced and life-saving tests. Those passing all of the tests, or the class making the highest scores, should be given special recognition.

CHAPTER XI (Page 227)

WATER SPORTS

The various stunts and games given in Chapter XI afford the student an opportunity to engage in wholesome physical and social recreation; they stimulate and maintain the interest in swimming and its branches, for students learn through play.

From the instructor's point of view, these games should serve as one means of enabling him to present his subject-matter and teach the various swimming skills and the ideals of good sportsmanship through play. Leading educators have realized the possibilities and advisability of teaching and training our citizens of the future by means of games. (Special suggestions and demonstrations for the method of teaching through play have been given in Chapters I, XI and XII.)

If you are employing the game method of teaching it must be educationally sound; that is, afford the students an opportunity to engage in the keenest kind of thinking as well as leadership. You must consider the student's innate physical and mental tendencies, be guided by his interests and his needs.

When presenting a game to your class for the first time, explain it briefly and demonstrate its action. Encourage your students to plan and lead their own game program when possible.

Music as well as play serves as a medium for teaching, for it satisfies the individual's instinctive sense of rhythm and is most enjoyable.

9. BRIEF REFERENCE LIST OF MATERIAL PERTAINING TO SWIMMING-POOL CONSTRUCTION, SANITATION AND EQUIPMENT

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"Swimming-Pools, Their Cost, Construction and Sanitation": Portland Cement Association, 111 West Washington St., Chicago, Ill.

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"Sanitation of Swimming-Pools," by Jack J. Hinman, Jr., Chief, Water Laboratory Division, University of Iowa, Iowa City, Iowa.

Spring-Board Equipment

For information concerning the construction, cost, etc., of the National Collegiate A. A. Standard Low and High Spring-Boards, write Ernst Brandsten (its designer), Director of Aquatics, Stanford University, Palo Alto, Cal.

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